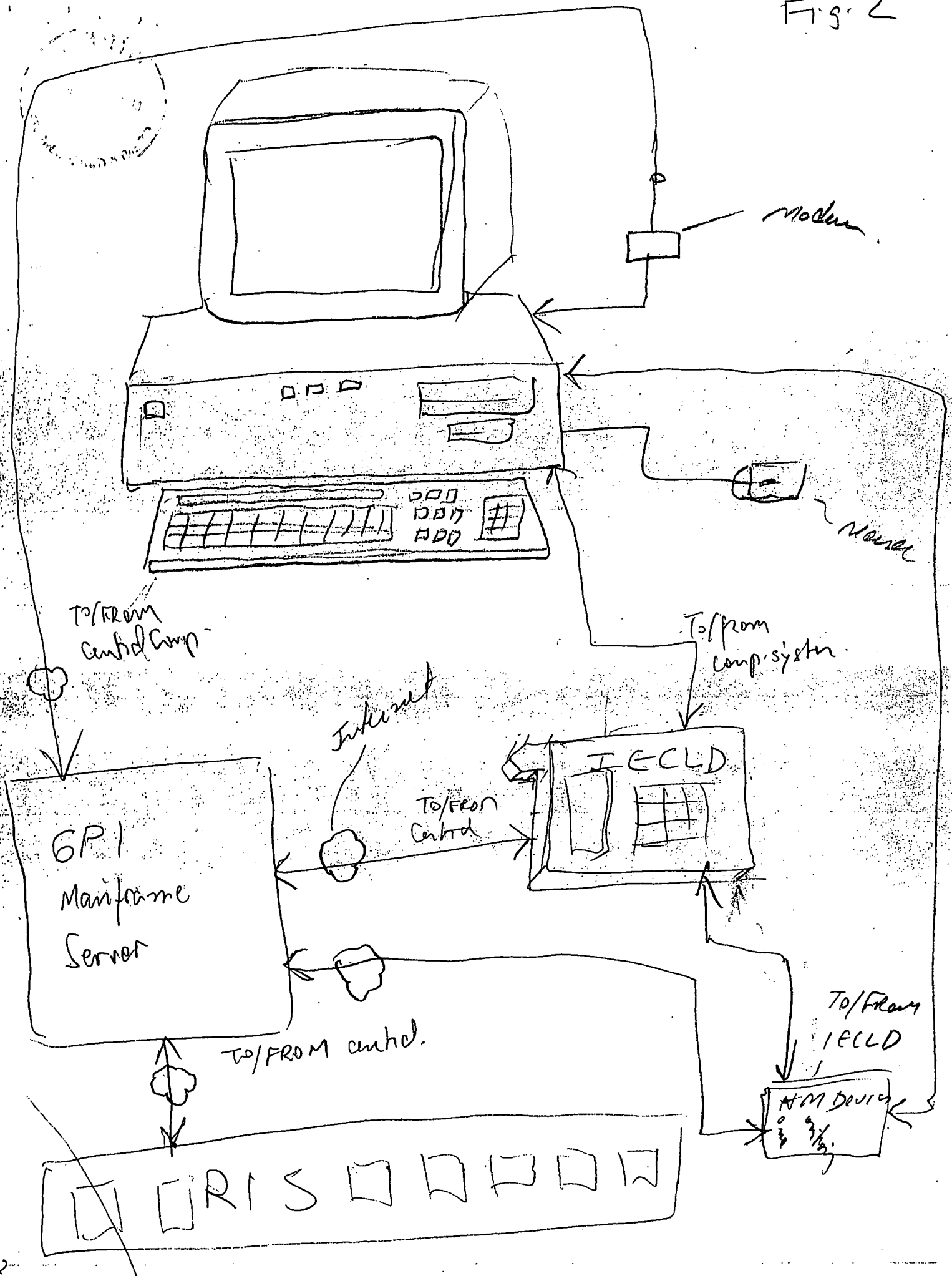
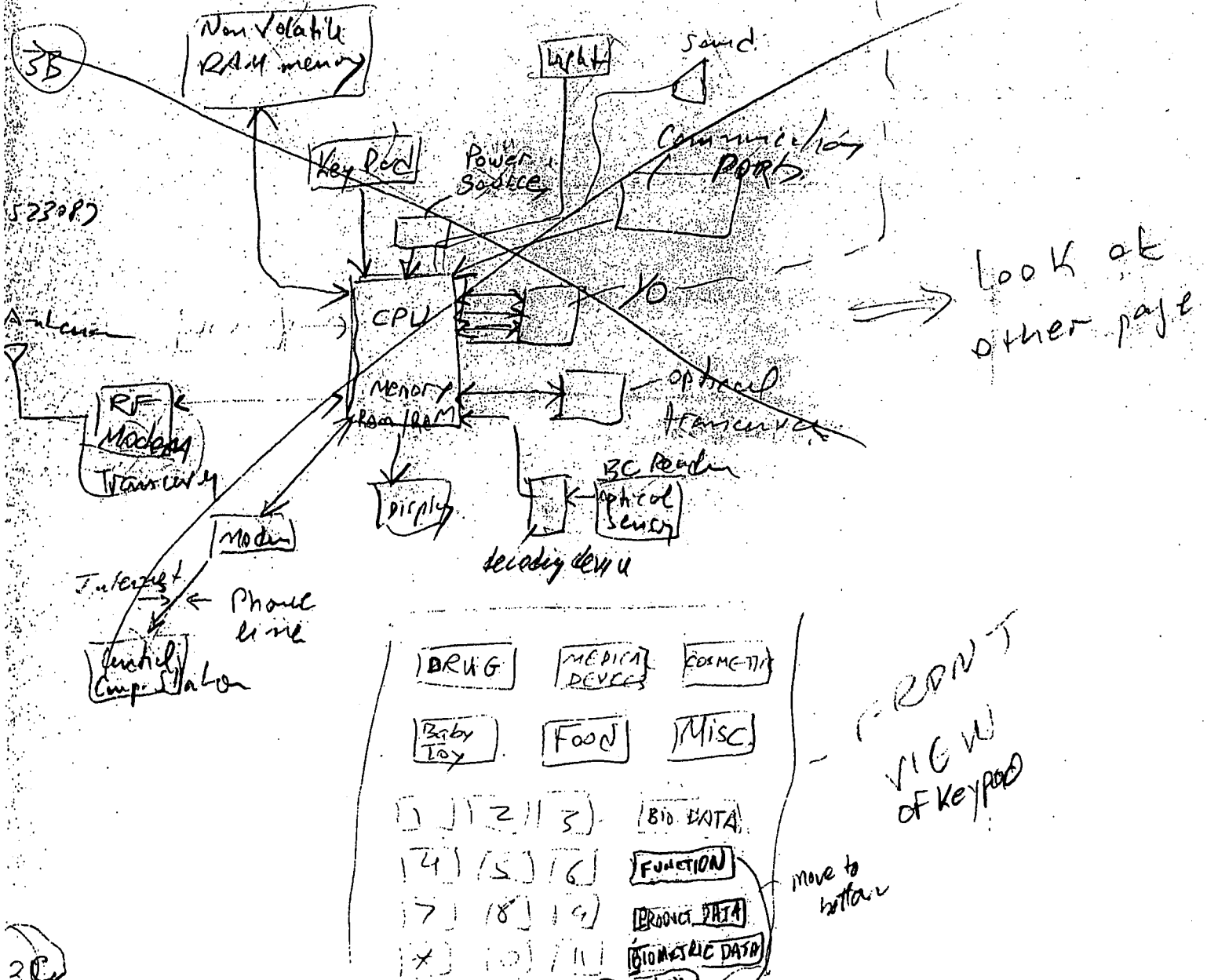
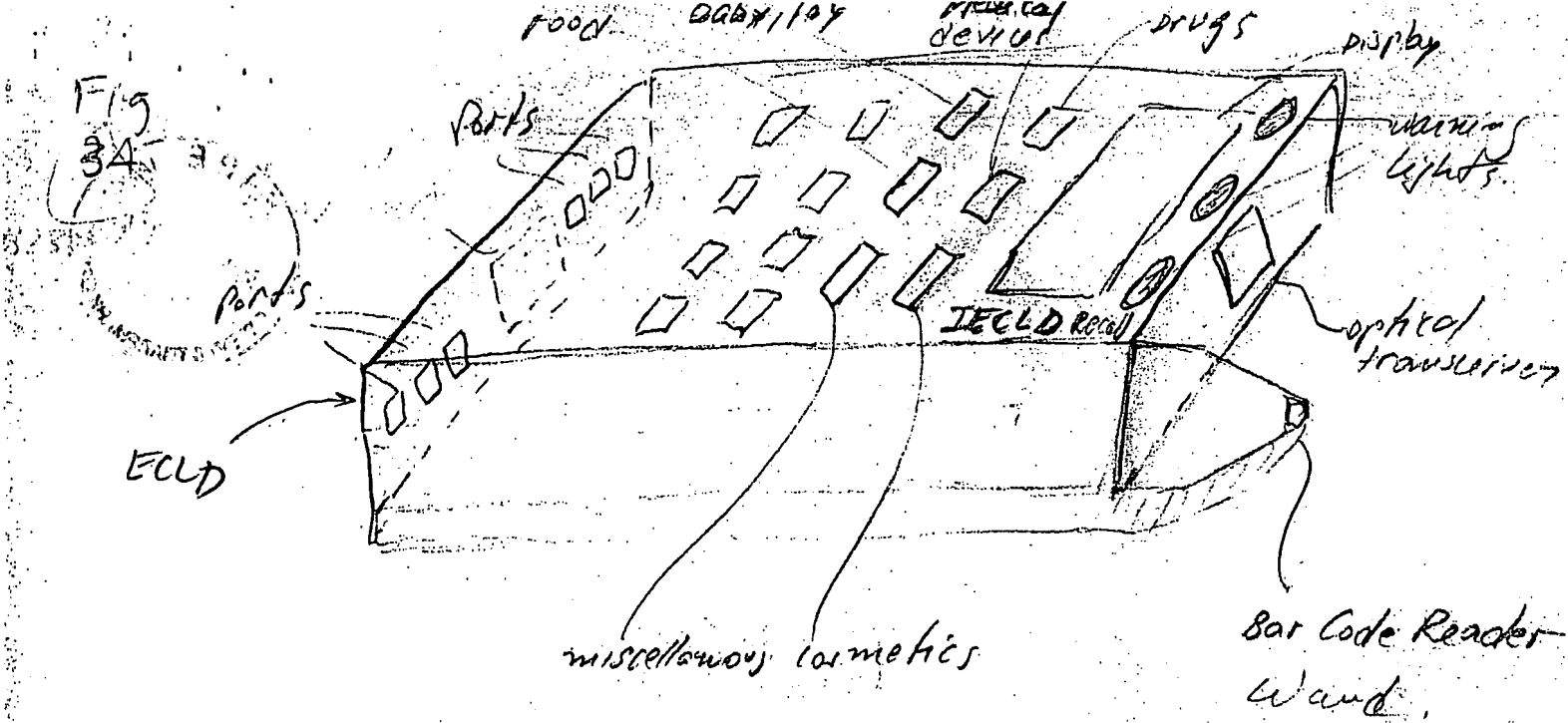


Fig 1.

Fig. 2







JEC'n

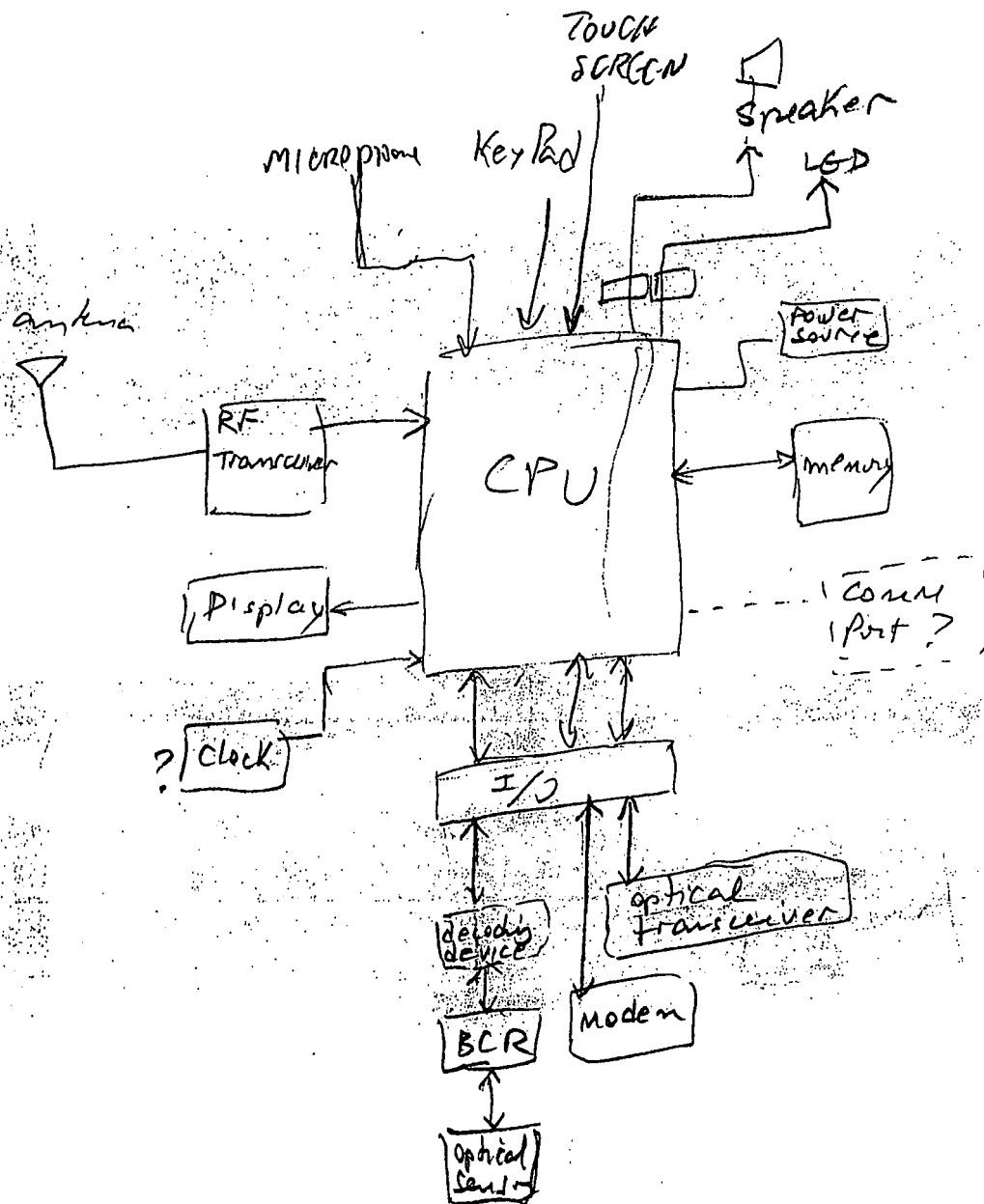
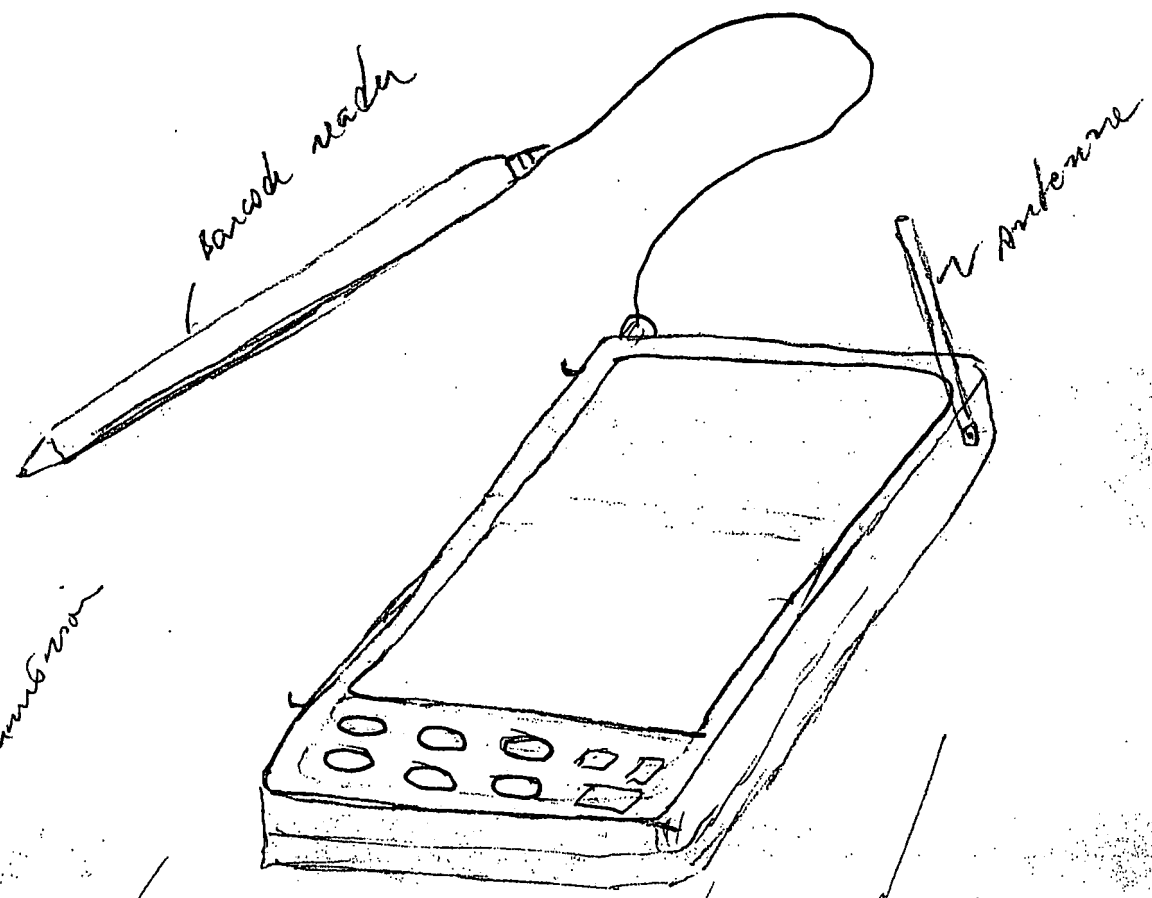


Fig 3B

FIG 4



Barcode reader

Antenna

Wireless communication

NMD

Tonometer.
Eye Pressure
Measurement

Intelligent
Contact
Lens
Blood
Glucose
monitoring
device

Heart
Rate
and
Rhythm

Blood
Pressure

scale



Fig 5A

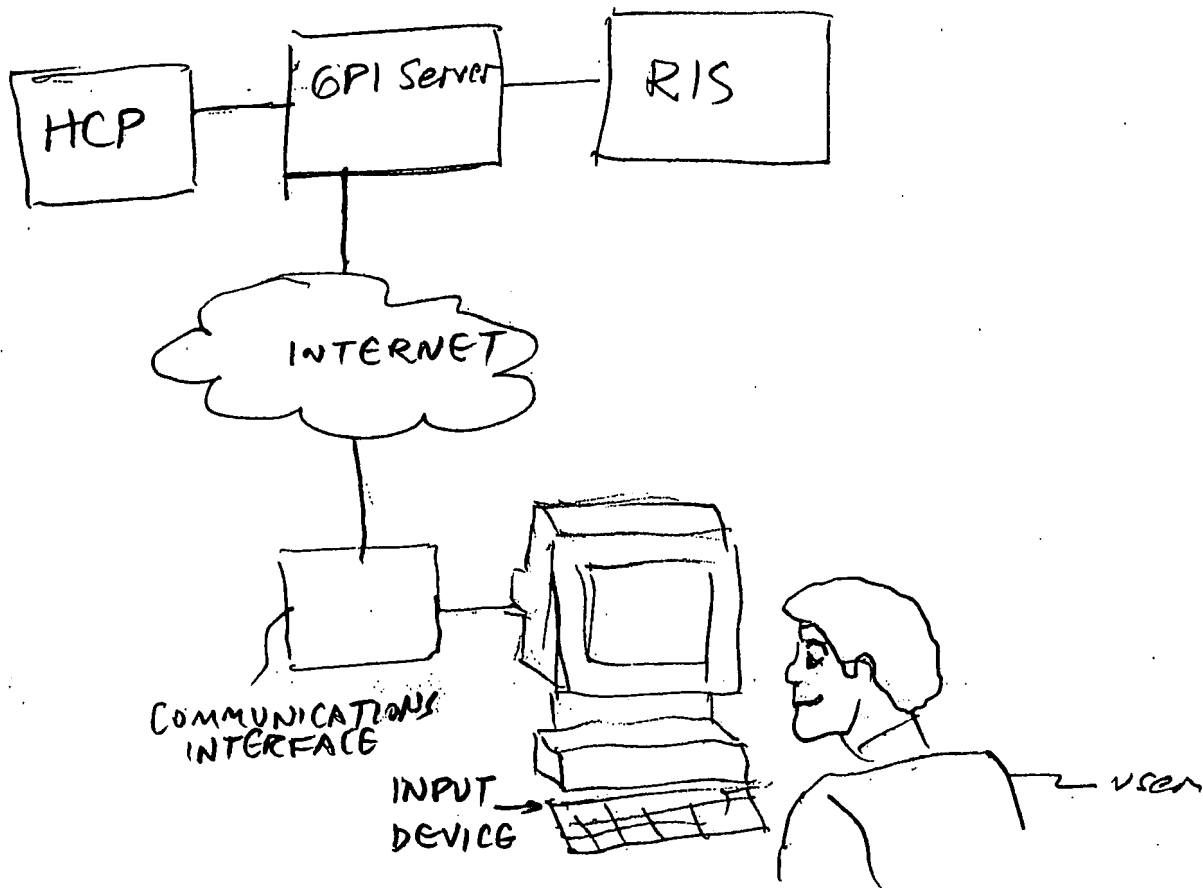
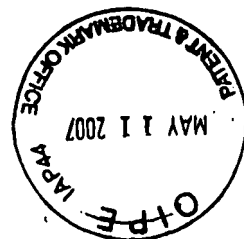
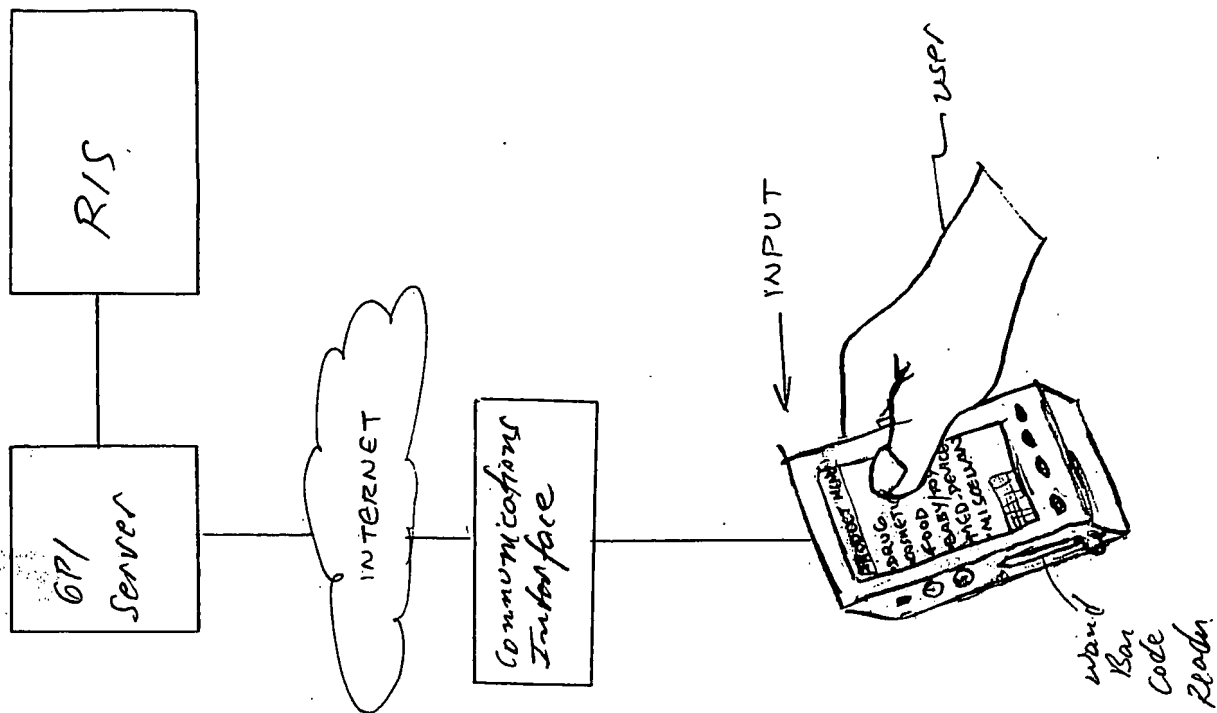
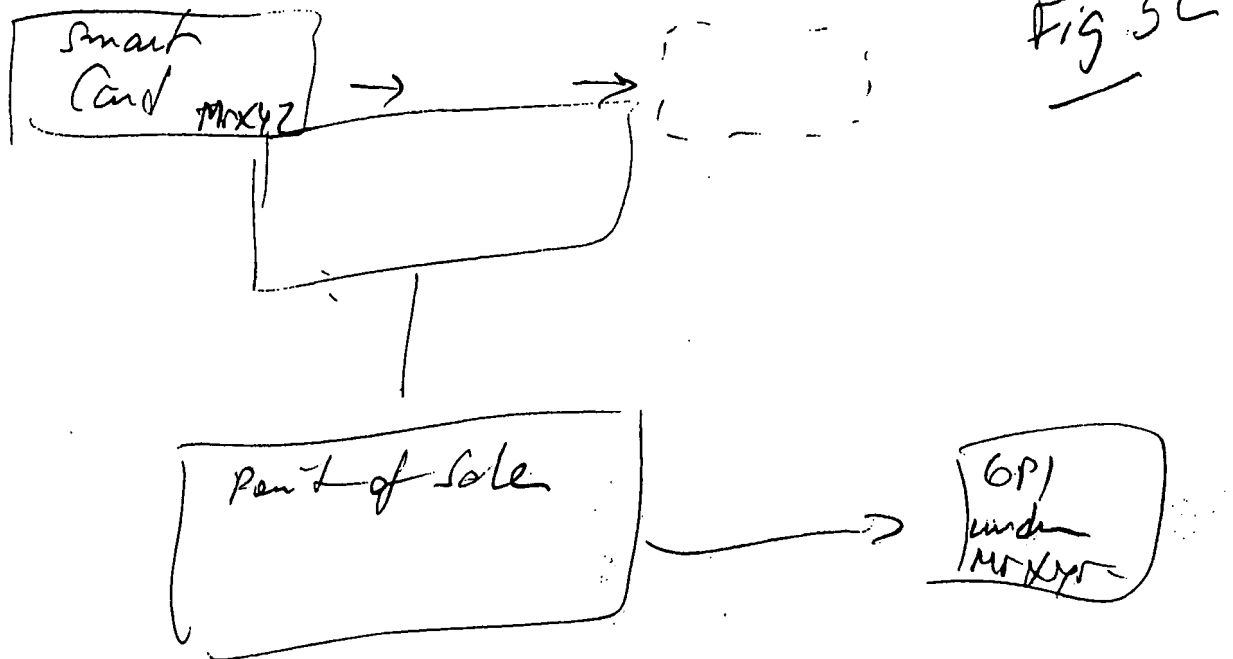


Fig 5B





Card can open connection with server



Structure of implementation
using Smart card

reapach Receptacle

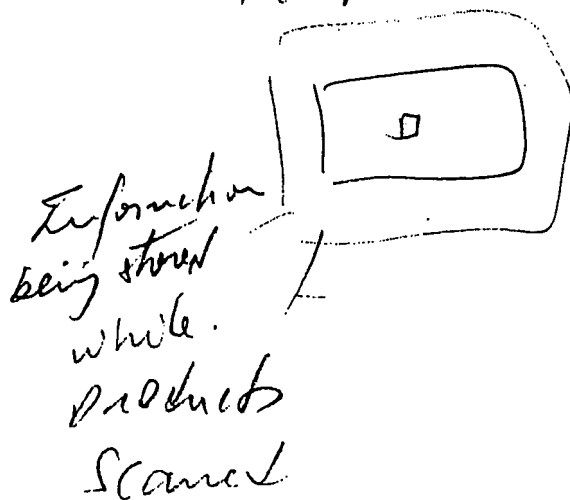
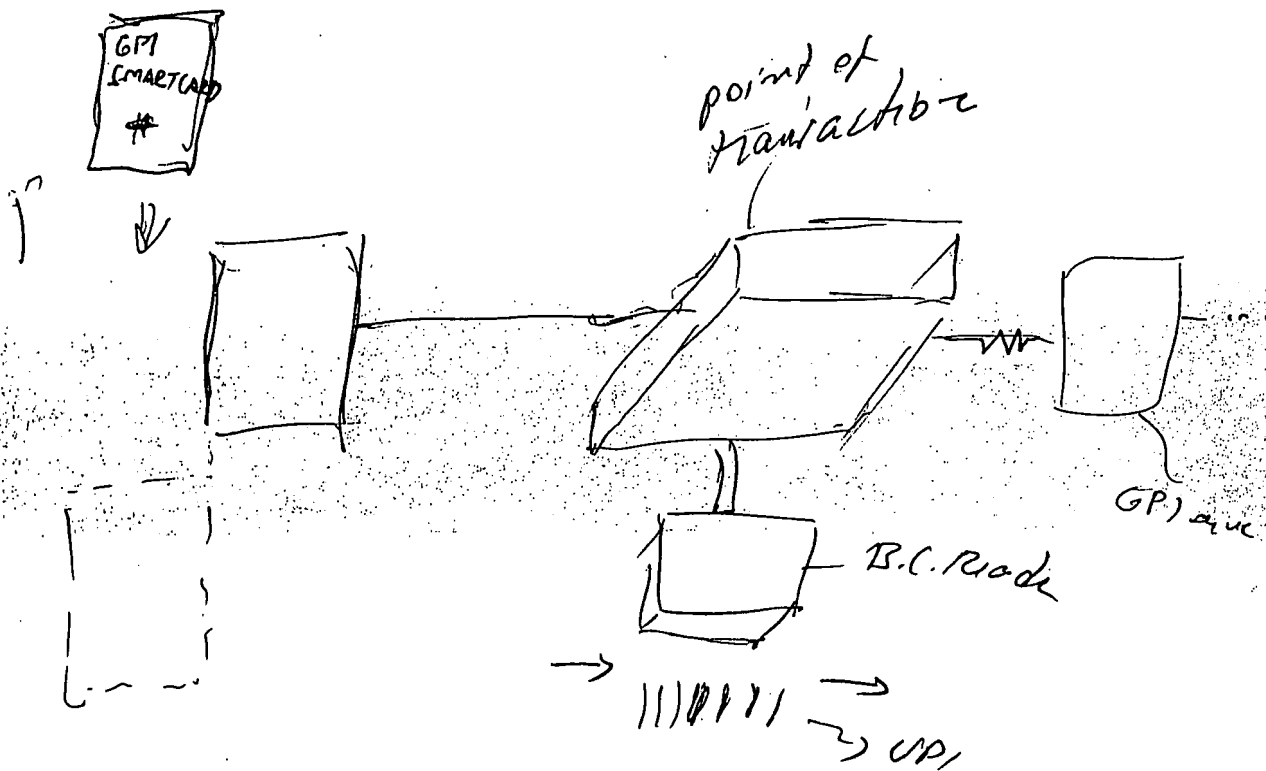




Fig 5D



device placed in a receptacle.

Pharmacy enters UPI at time of transaction

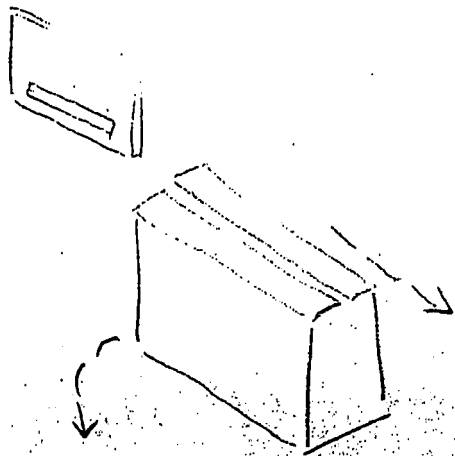


Fig 5C

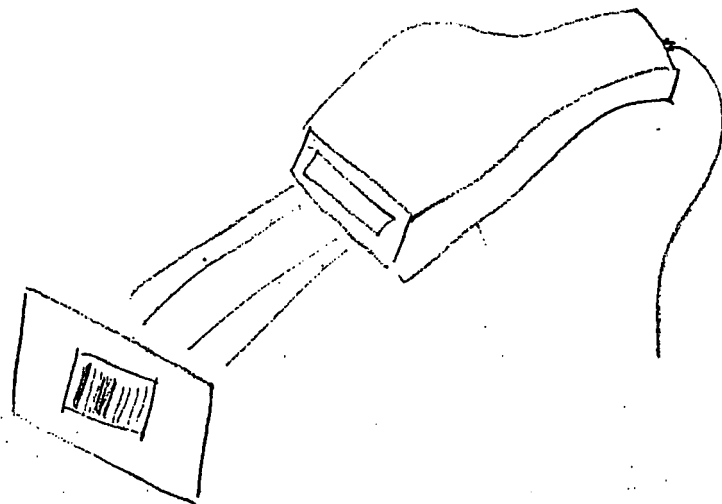


Fig 5D

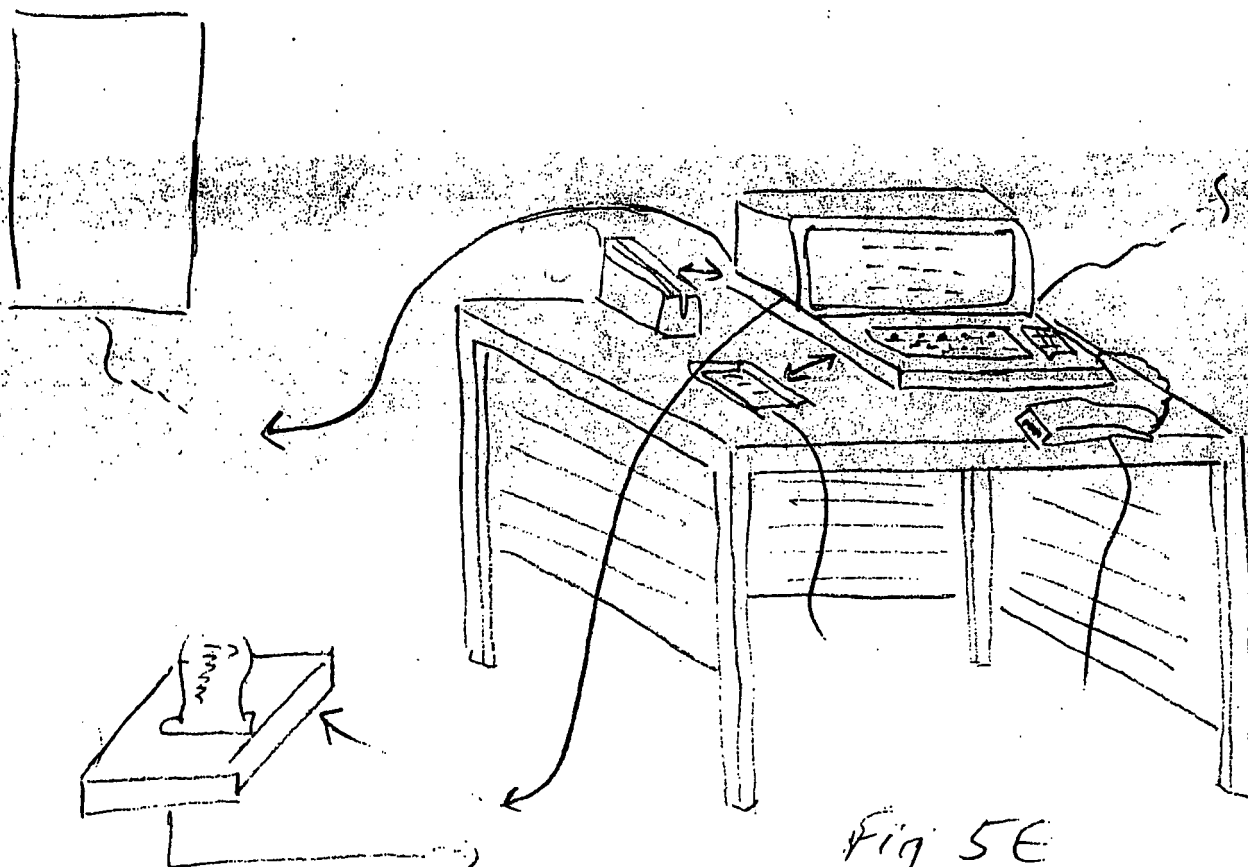


Fig 5E

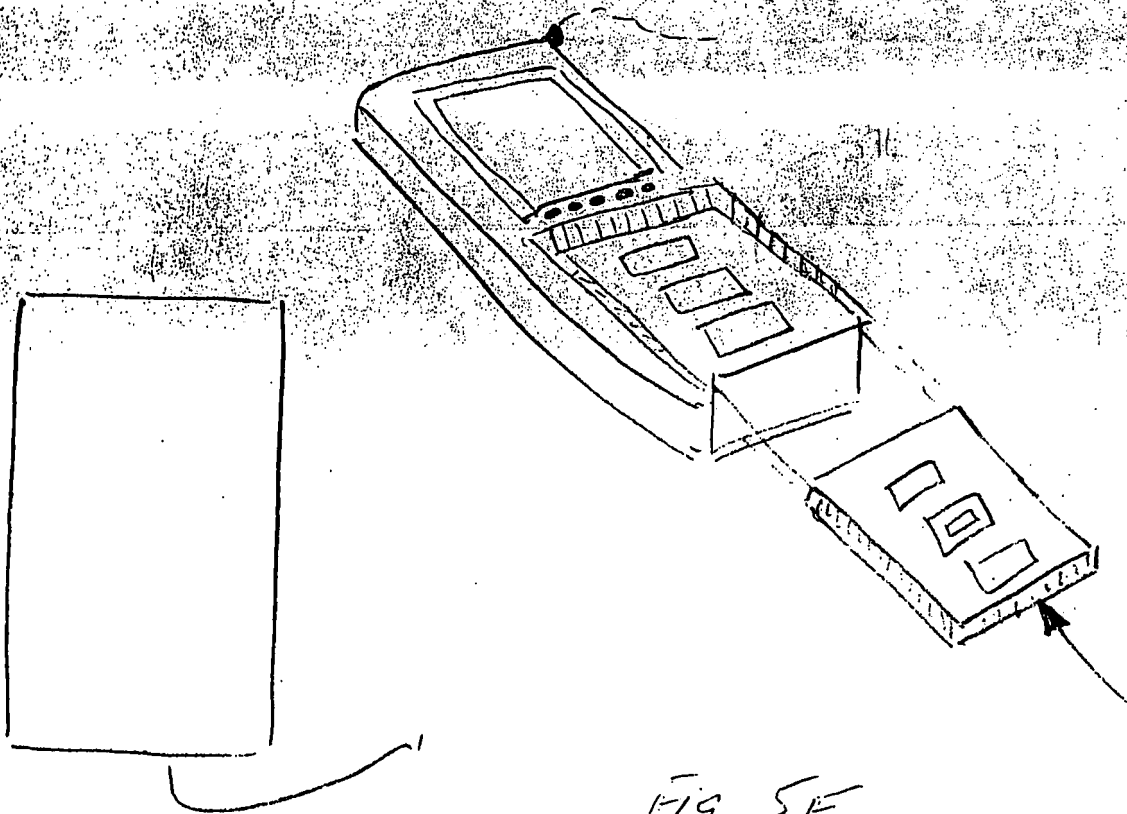
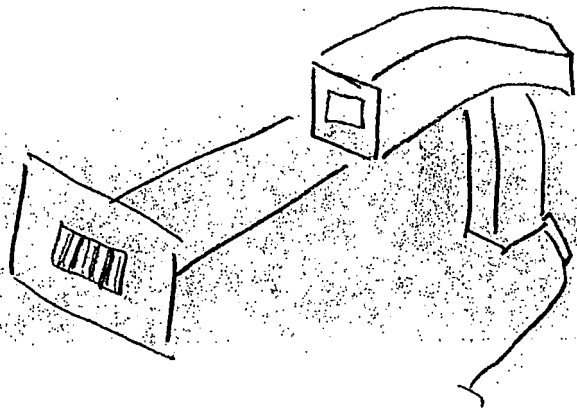
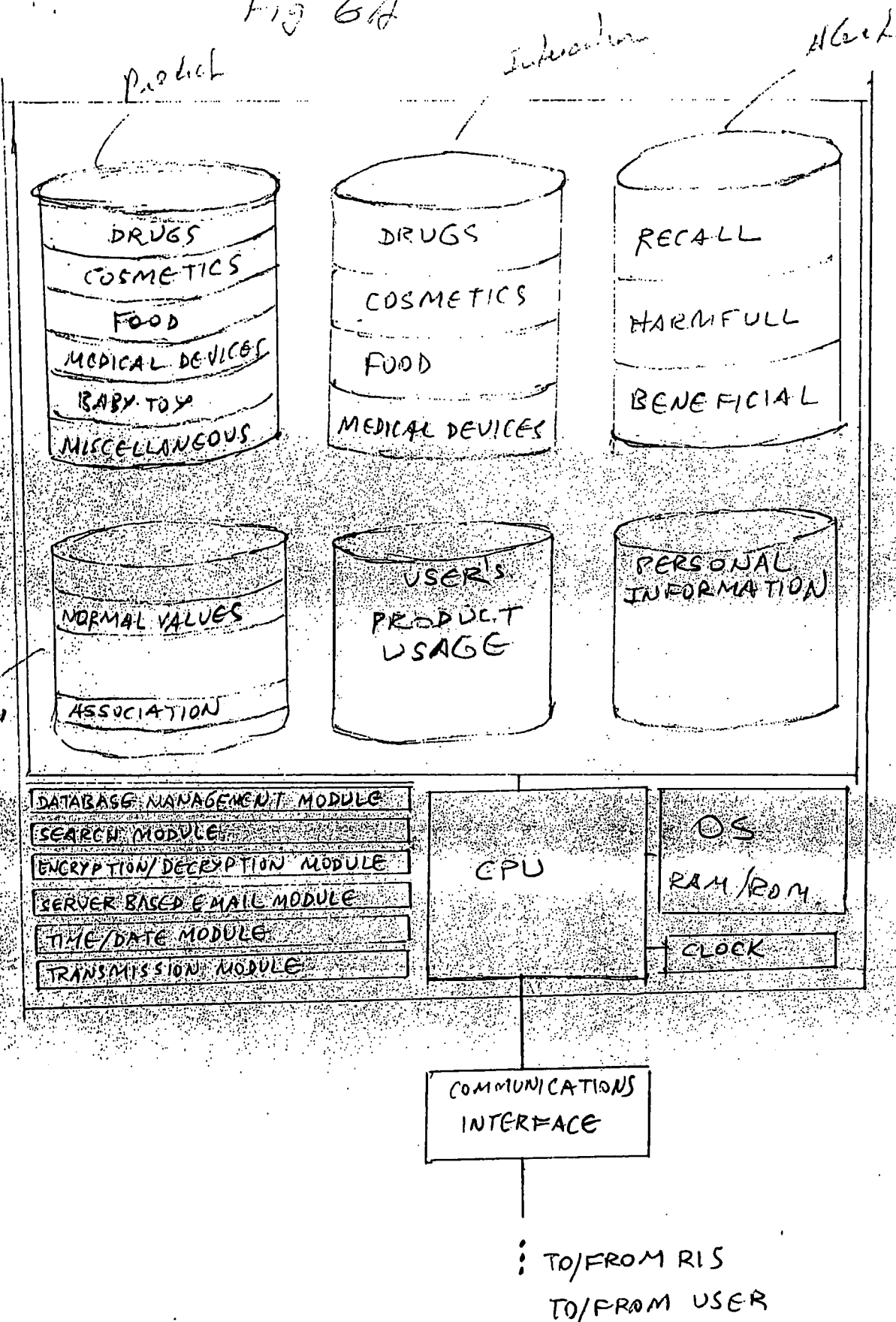


Fig 5F

Fig 6A





DATA STORAGE
MEMORY DEVICE

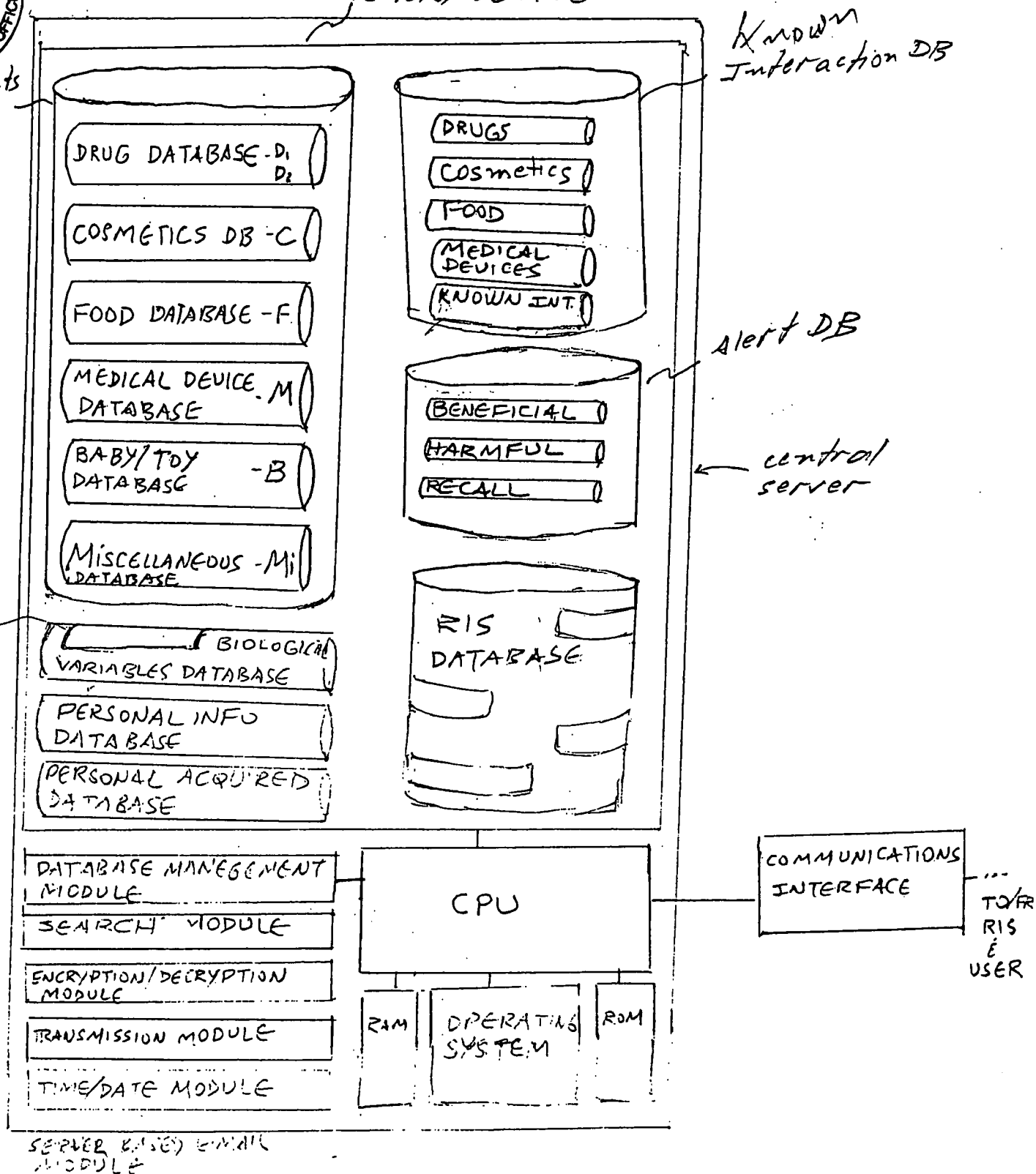


Fig 6B



Fig 7

7A

Welcome to GPI - FREE Web-based info

New Users
[Register here](#)

About GPI

Registered Users

Login name

Password

[LOGIN](#)

[why to sign up?](#)
[Who should sign up?](#)
[Contact us](#)
[Policy](#)
[Additional Services](#)

[If you are not registered but want to know about any warnings or Recalls Click here](#)

7C

Search

Search Product Dexfenfluramine

- ☐ Drugs - Prescription (D1)
- ☐ Drugs - OTC (D2)
- ☐ Cosmetics (C)
- ☐ Food (F)
- ☐ Toy/Baby Products (B)
- ☐ Medical Devices (M)
- ☐ Miscellaneous (Mi)
 - ☐ MiE - electronics
 - ☐ MiA - automotive
 - ☐ MiH - house hold

7B

GPI - Products: Alerts and Recall

Products Used for Mr XYZ @ GPI.org

- ☐ Drugs (D1: Prescription, D2: OTC)
- ☐ Med devices (M)
- ☐ Food (F)
- ☐ Cosmetics (C)
- ☐ Toy/Baby Products (B)
- ☐ Miscellaneous (Mi)

Product	Information
D1: Dexfenfluramine	Recall
D2: Loratadine	Warning
D2: Ibuprofen	Recall
C: Shampoo	Recall
M: Prostheses	Warning level
F: Curry Soap	Recall
B: Crib	Recall
Mi: Hair Dryer	Warning
D1: Vetaprenil	Recall

[BIOLOGICAL VARIABLES](#)

link(iii)

7E

RECALL INFO

On September 15th, 1997, the FDA requested that the manufacturer of Dexfenfluramine, the WA Pharmaceutical Co., voluntarily remove the above drug from the market. The removal from the market is based on findings indicating that patients taking this drug developed heart valvular disease, which may cause heart failure and put patients at risk for bacterial endocarditis. Unfortunately, some patients with heart failure who underwent surgical correction of the valvular damage died. Anyone on the drug should stop using it at once, should see a doctor and should consider an echocardiogram...

More on what precautions to take:

- Appetite Suppressants. [Get more info](#)
- For doctors appointment. [Click here](#)
- For echocardiogram. [Click here](#)
- For insurance information. [Click here](#)
- If you are registered user please check your e-mail "GPI appointment" for the appointments already scheduled and insurance approval obtained or [click here](#)
- For support Groups [Click here](#)

7D

BIOLOGICAL VARIABLES - MR XYZ

Levels: average last 4 weeks

Blood Pressure: 140/90

Eye Pressure: Right: 27, Left: 20

Temperature: 98.8 F

Weight: 200 lbs

Blood Sugar: 170

Cholesterol: 230

- ☐ Interaction with drugs
- ☐ Interaction with medical devices
- ☐ Interaction with food
- ☐ Interaction with cosmetics



USER'S PERSONAL INFORMATION DB

UsernameX→

A B C D E F G H I J K

UsernameY→

A B C D E F G H I J K

:

PRODUCT DB

UPI

[1012] → UN
UN
UN

[2112]

→ UN
UN
UN
UN

:

USER'S PRODUCT USAGE DB

UN

UPI

MrABC@GPI.org → 0050
1234
56789

MrABC@GPI.org → UPI

DrDEF@IBM.com → UPI
UPI

oph4sci@TKI.gov → UPI
UPI
UPI
UPI
UPI

:

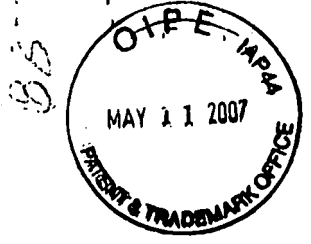
DISEASE ASSOCIATION DB

EXPERT SYSTEM

BV

ID

Blood pressure ↑ Hypertension
Blood pressure ↓ Hypotension
Blood sugar ↑ Diabetes
Blood sugar ↓ Hypoglycemia
Eye pressure ↑ Glaucoma
:



PRODUCT INFORMATION DB

UPI	GI	CI	HD	DAR ₉	LAR ₉
0031 →					

PI

UPI	WM	HD	DAR ₉	LAR ₉
Aug M				
Food F				

0041
:

BIOLOGICAL VARIABLES D.B

UN	PAR	VA	DA
MrABC@GPI.org →	Eye Pressure	28.30	most recent
		14.16	
		17.27	least recent
	Glucose	103	
		200	
	Liver Enzymes		
	Triglycerides		
	Weight		

MrABC@GPI.org →
:

BU



ALERT DB

UPI	A.I	HD	AL	CI	HD	DARg	LARg	PIE	Name	M	Is	Rg	Message	Dir.
0051														

0022 →

:

UPI	U/M	HD	DARg	LARg
drug A				
drug B				
food C				
cosmetic X				

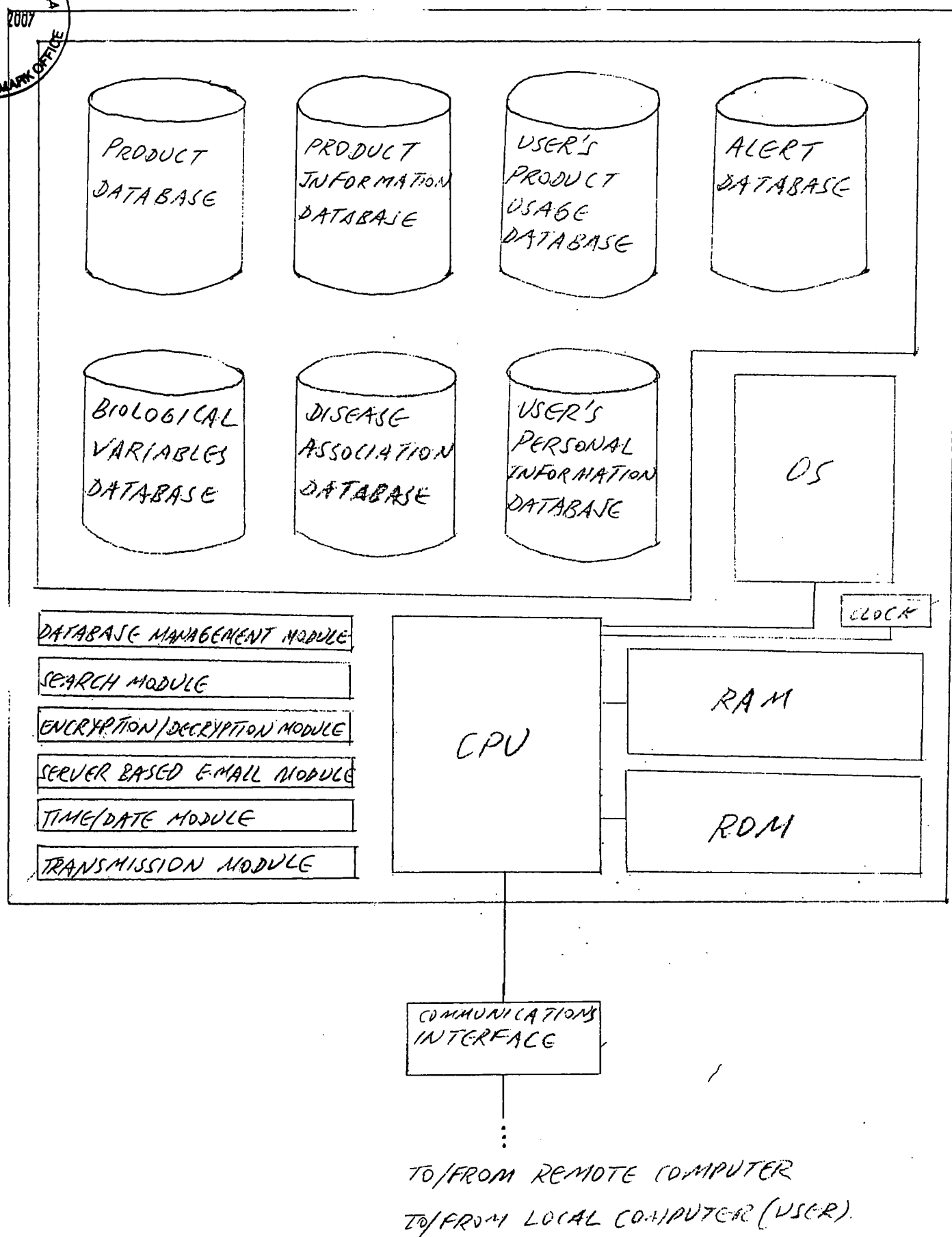
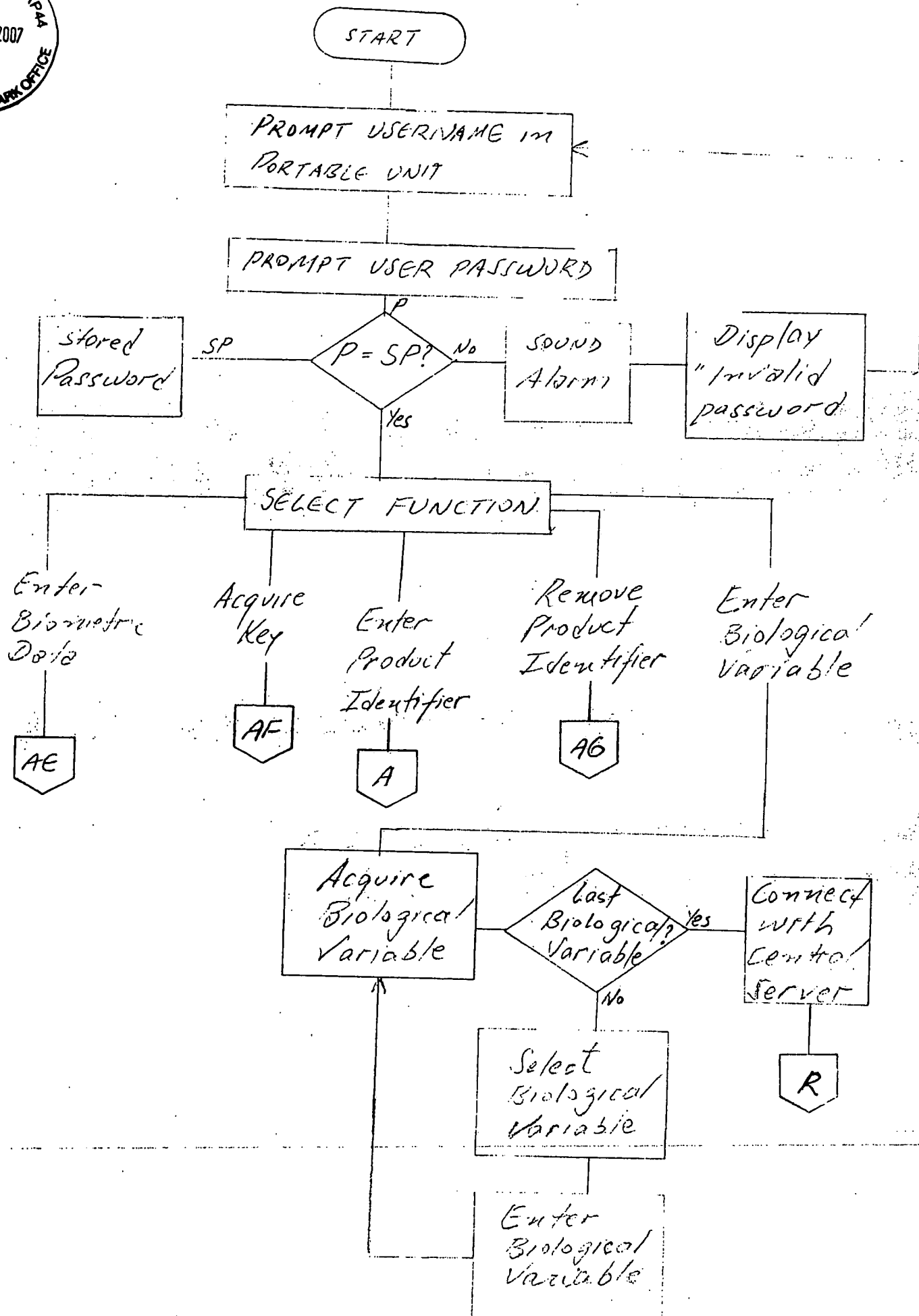
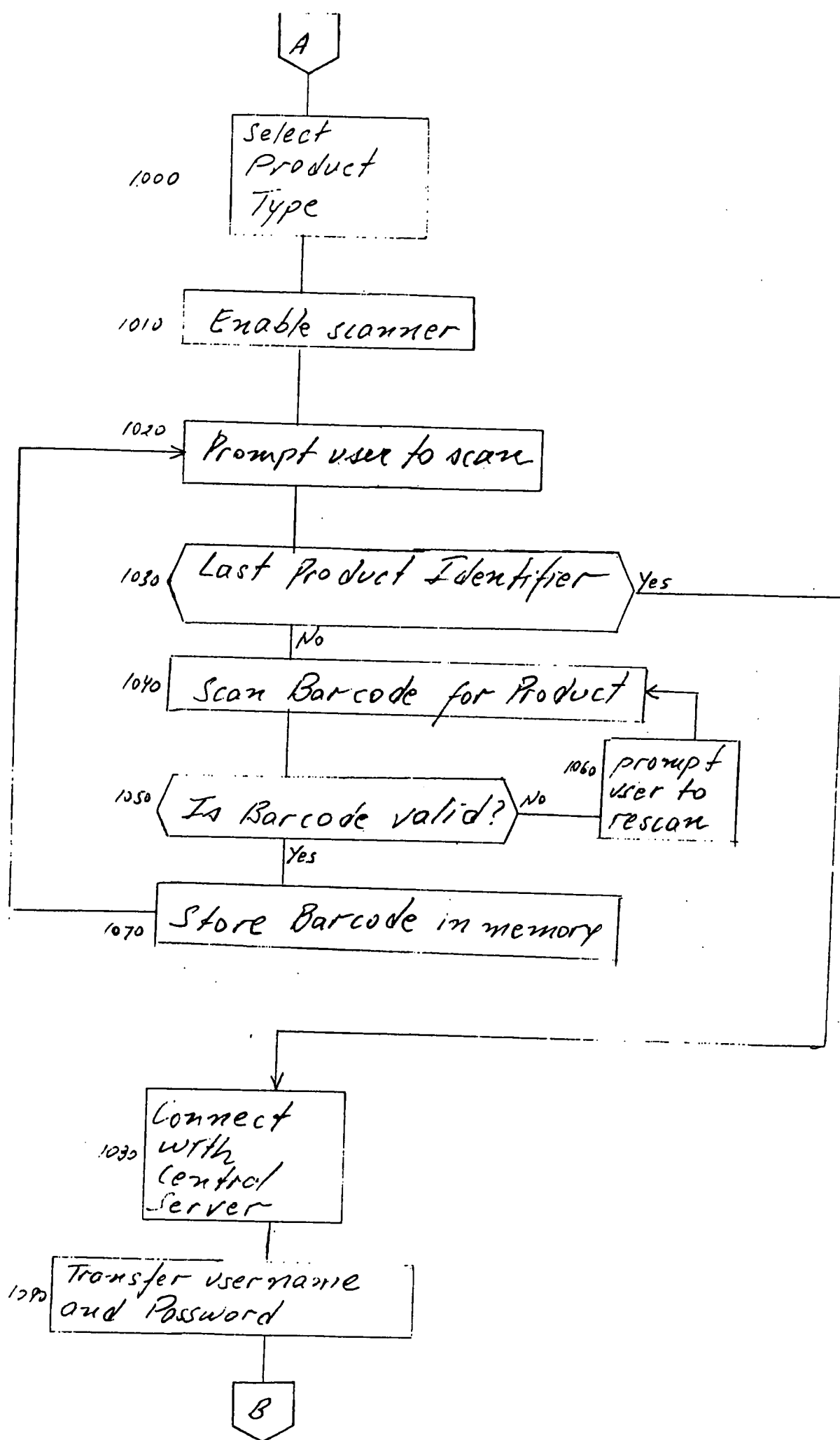
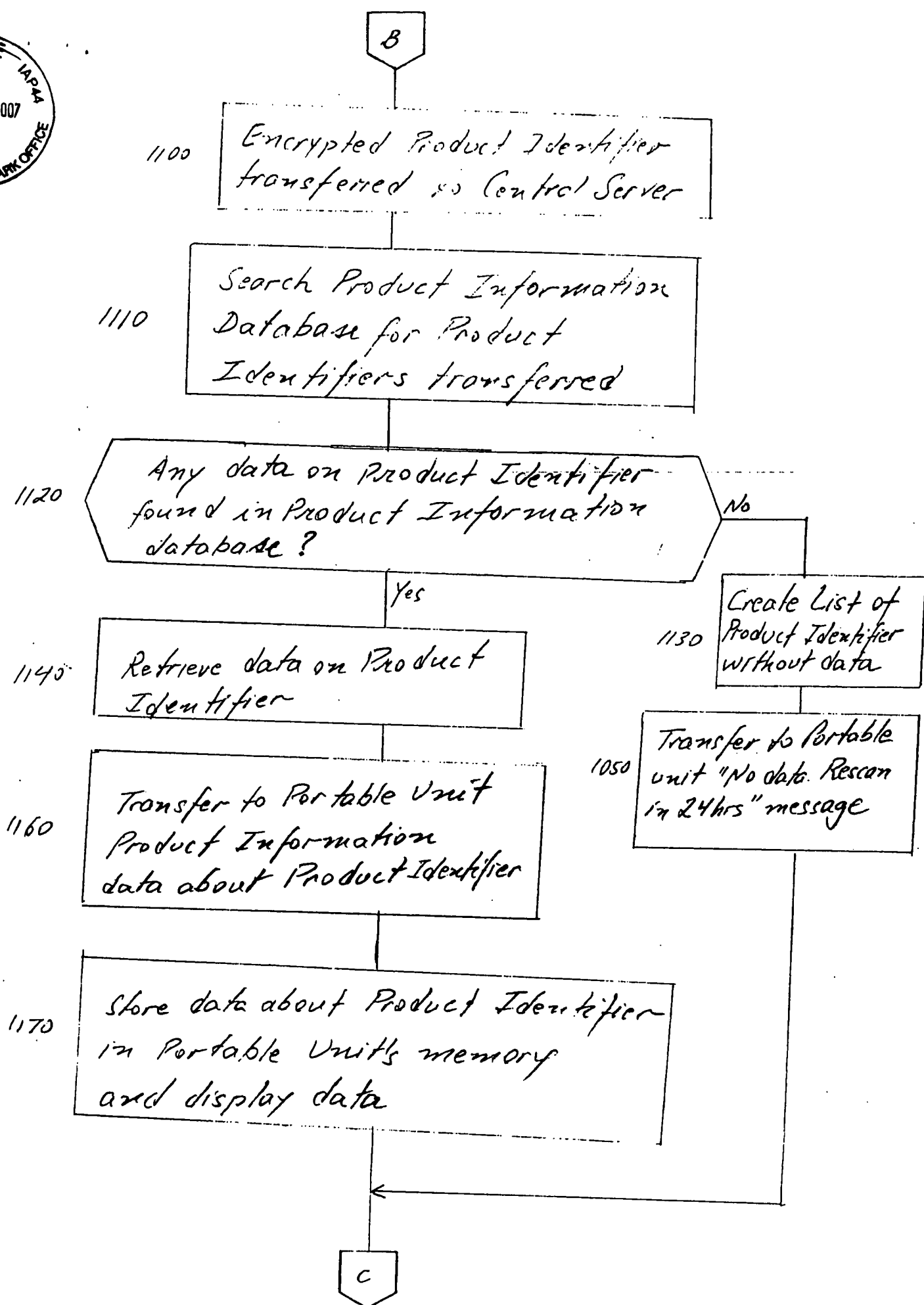


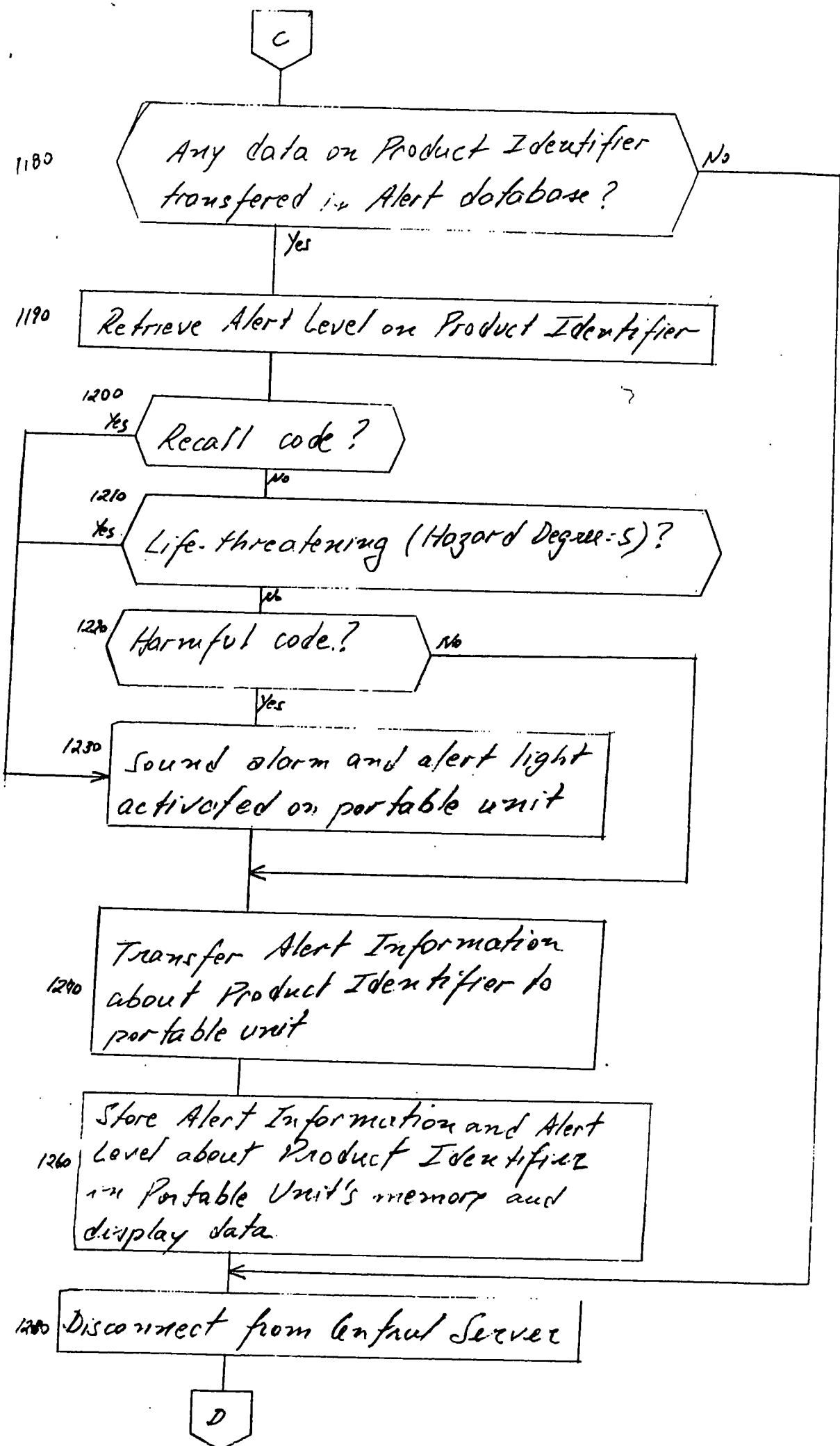


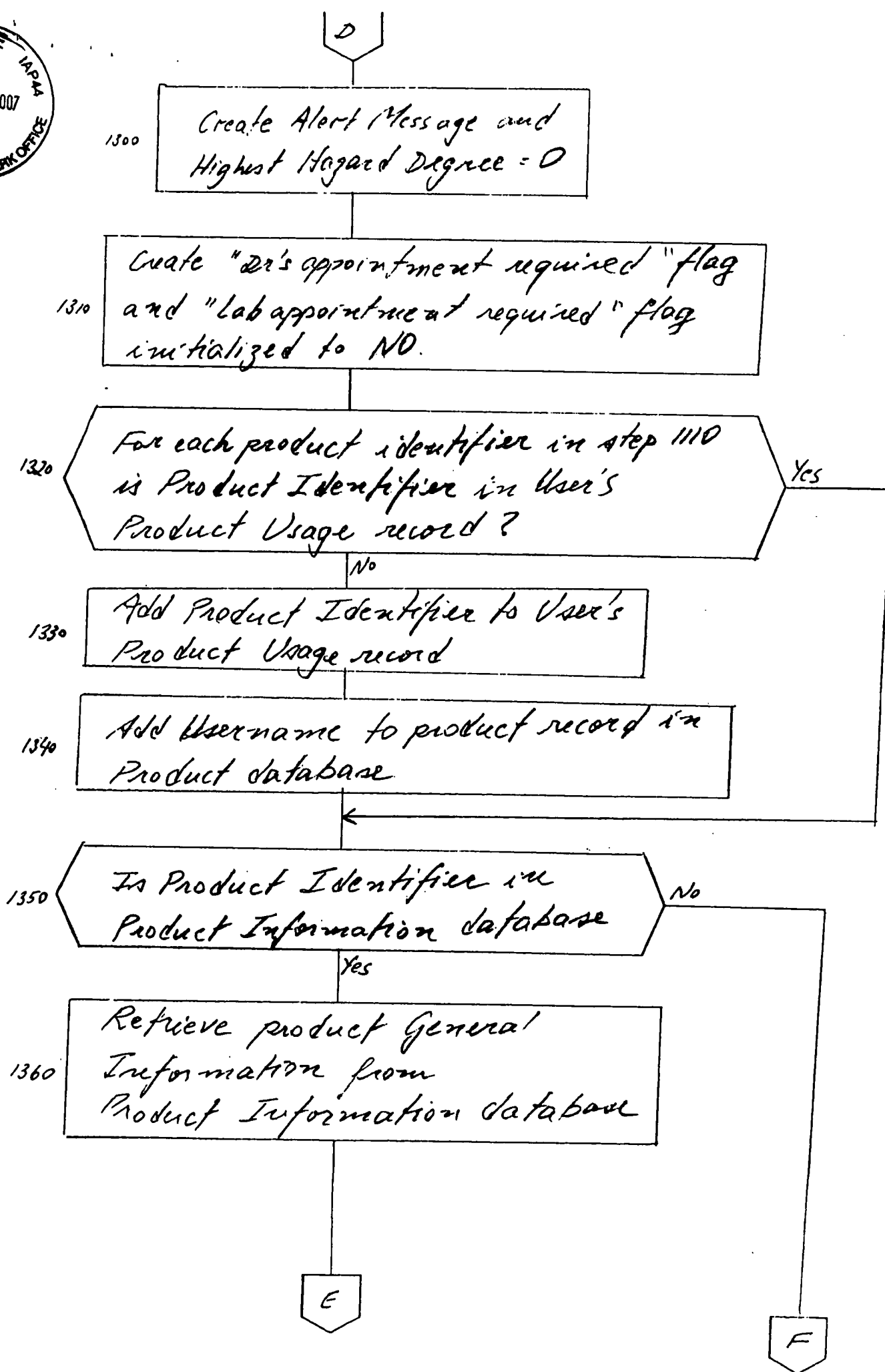
Fig 10

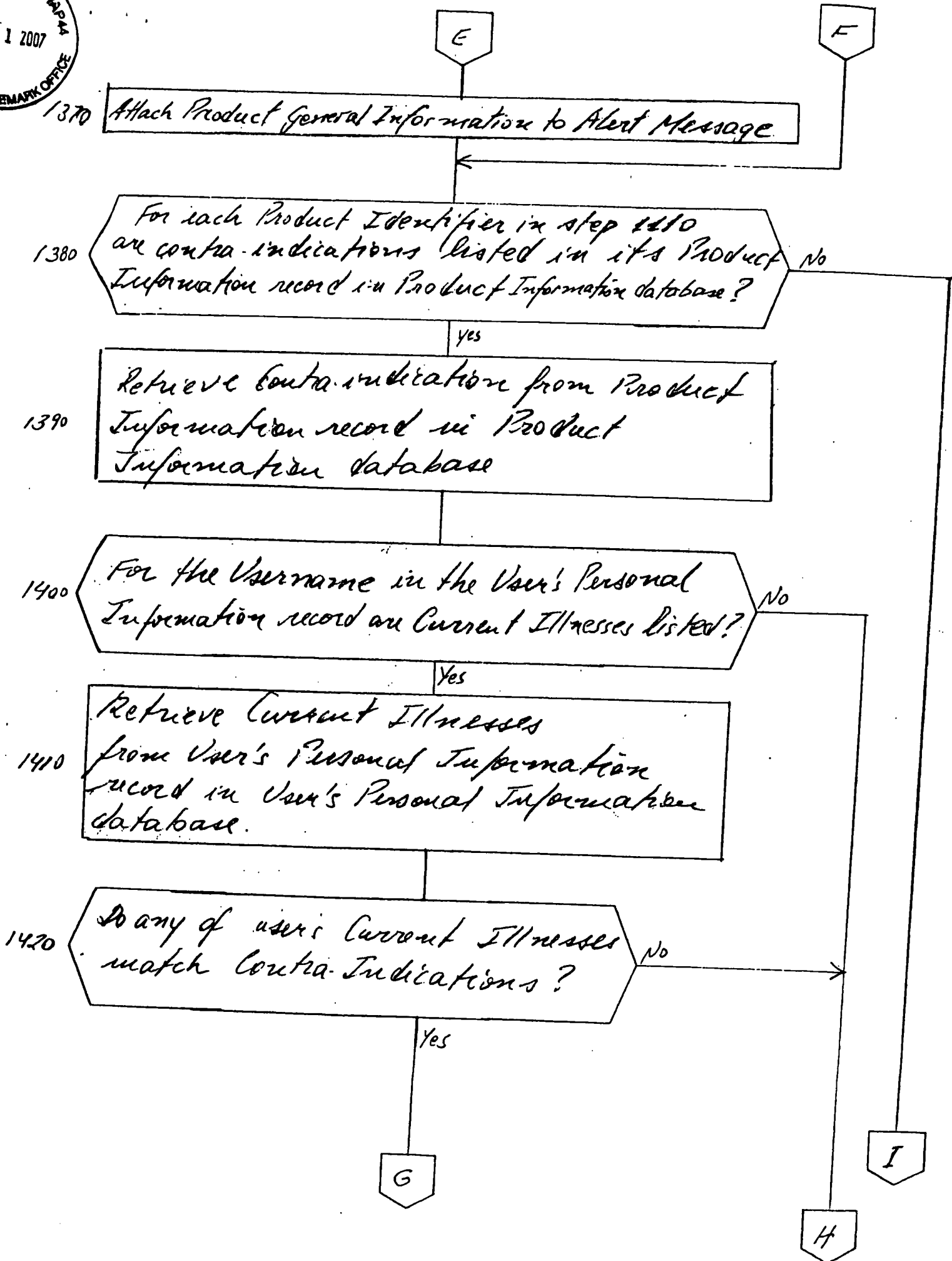


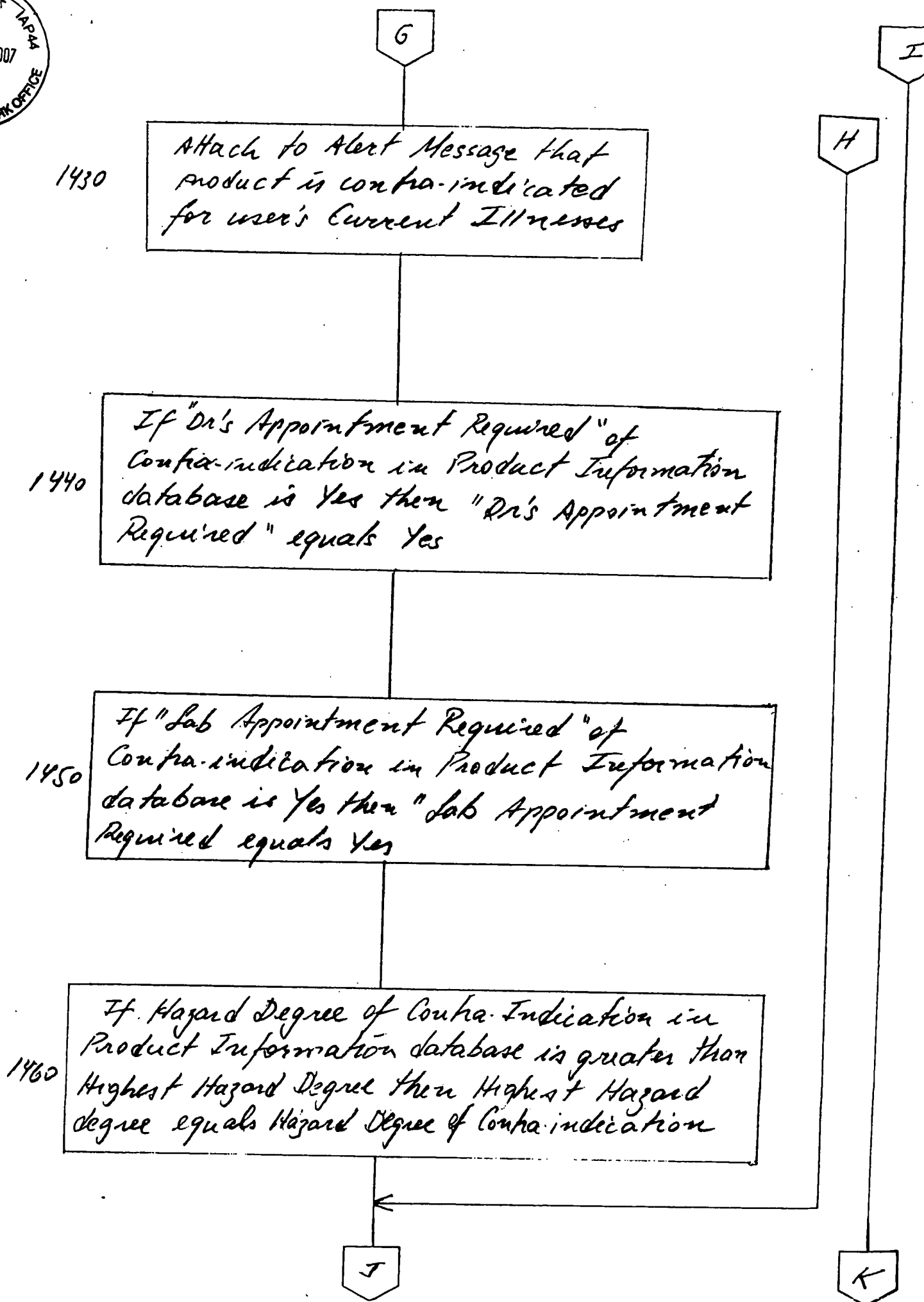














J

1480

For the Username in the Biological Variables database are biological variables Parameter Listed?

No

Yes

1490

Retrieve Biological Variables for Username

1500

Based on User's Biological Variables using Disease Association Database determine Identified Diseases

1510

Do any of Identified Diseases match Contra-Indications in Product Information database?

No

Yes

1520

Attach to Alert Message that product is contra-indicated for Identified Diseases indicated by user's Biological Variables

1530

Repeat steps 1440 and 1450

1540

If Hazard Degree of Contra-indication in Product Information database is greater than Highest Hazard Degree then Highest Hazard Degree equals Highest Hazard Degree of Contra-indication.

L

K



L

1550

Repeat from steps 1380 to 1540 using Alert database instead of Product Information database

1560

For each Product Identifier in step 1110 are there product interactions linked in Product Interaction field in Product Information database?

No

Yes

1570

Retrieve Product Identifiers in Product Interaction field in Product Information database based on Product Identifiers at step 1560

1580

Retrieve Product Identifiers for user from User's Product Usage database

1590

Do any Product Identifier from step 1570 match Product Identifier from step 1580?

No

Yes

M

N



M

N

1600

Retrieve Product Interaction Warning Message from Product Interaction field in Product Information database based on Product Identifier from step 1560 and Product Identification from match at step 1590

1610

Attach to Alert Message Interaction Warning Message

1620

If "Dr's Appointment Required" of Interaction Warning Message equals Yes then "Dr's Appointment Required" equals Yes

1630

If "Lab Appointment Required" of Interaction Warning Message equals Yes then "Lab Appointment Required" equals Yes

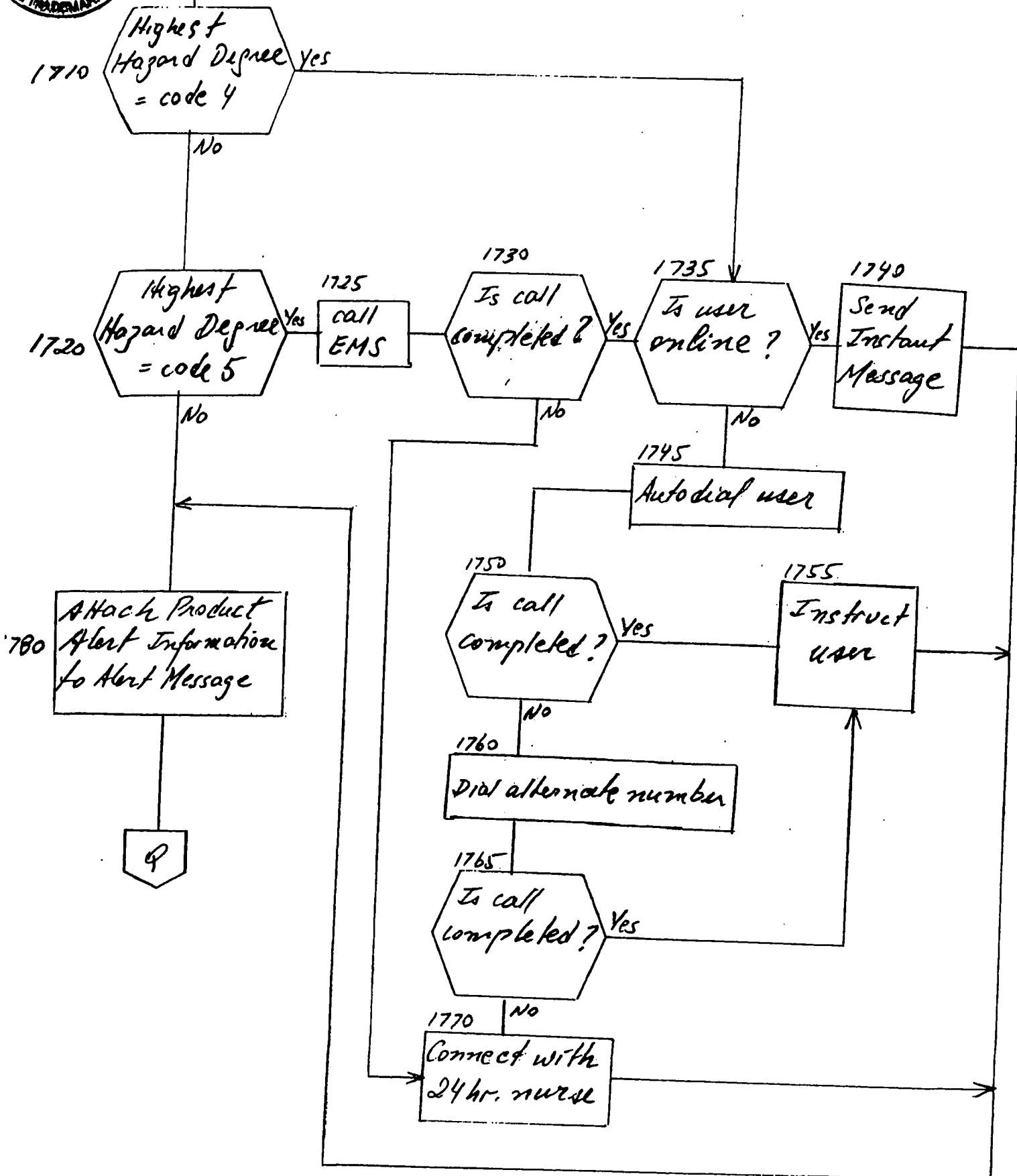
1640

If Hazard Degree of Interaction Warning Message is greater than Highest Hazard Degree then Highest Hazard Degree equals Hazard Degree of Interaction Warning Message

O



P





0

1660

Repeat from steps 1560 to 1640
using Alert database instead
of Product Information database

1670

For each Product Identifier in
step 1110 is there a record in
Alert database?

Yes

1680

Based on Product Identifiers at step 1670
using Hazard Degree in Alert Information
field in Alert database determine
highest value

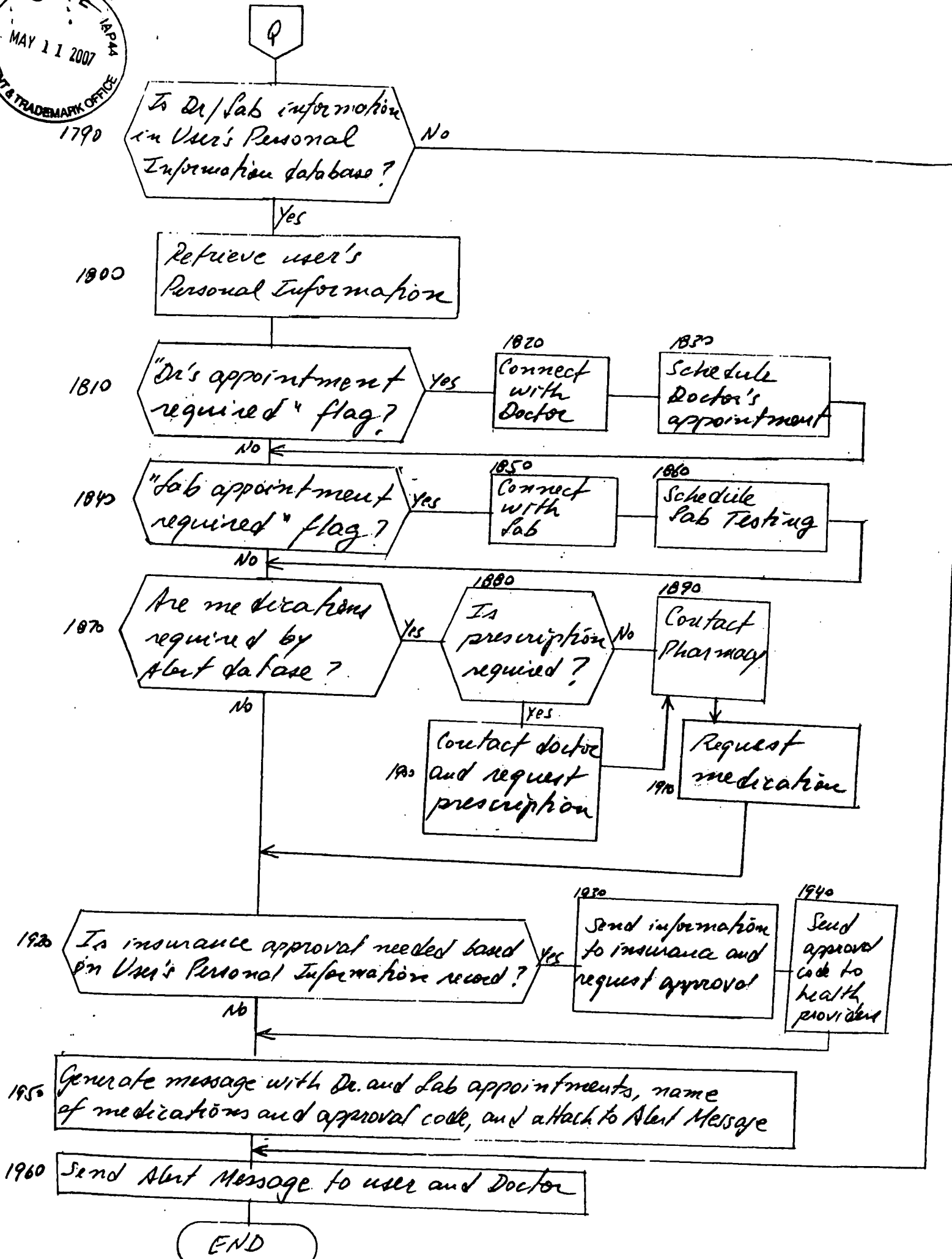
1690

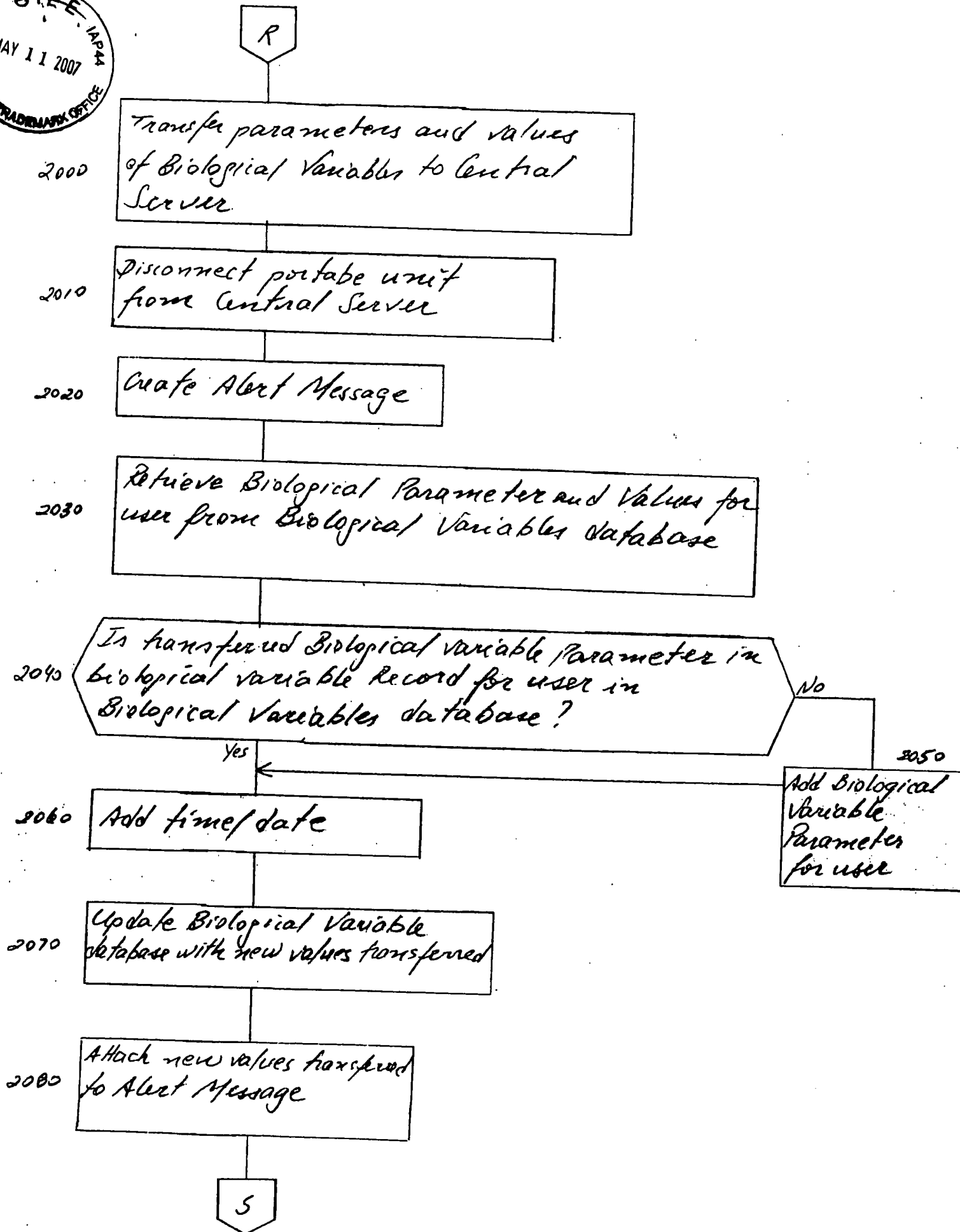
If highest value is greater than Highest
Hazard Degree then Highest Hazard Degree
equals highest value

1700

Retrieve product Alert Information for
Product Identifier from Alert Information
field in Alert database

P







5

2090

Retrieve from Personal Information database normal range of Biological variables for user

2100

Are transferred Biological variables within normal range?

Yes

2110

Attach Biological Variable values are normal to Alert Message

T

No

2120

Retrieve timely monitoring period from User's Personal Information database

2130

Retrieve from Biological Variable Database the date the Biological Variable was last transferred

2140

Is today's date minus date of last transferred biological variable less than timely monitoring period?

Yes

2150

Attach Abnormal Value but timely monitored to Alert Message

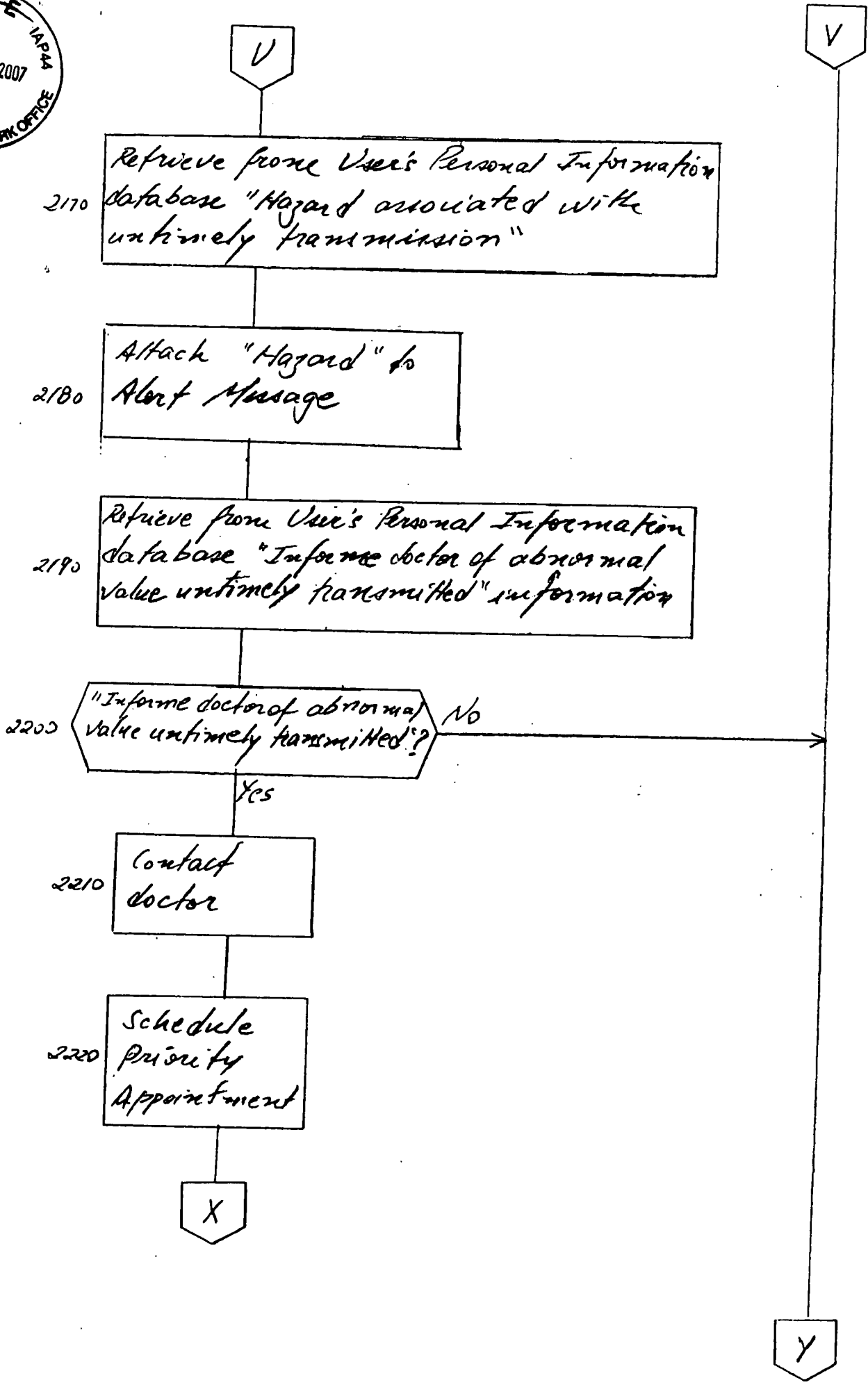
No

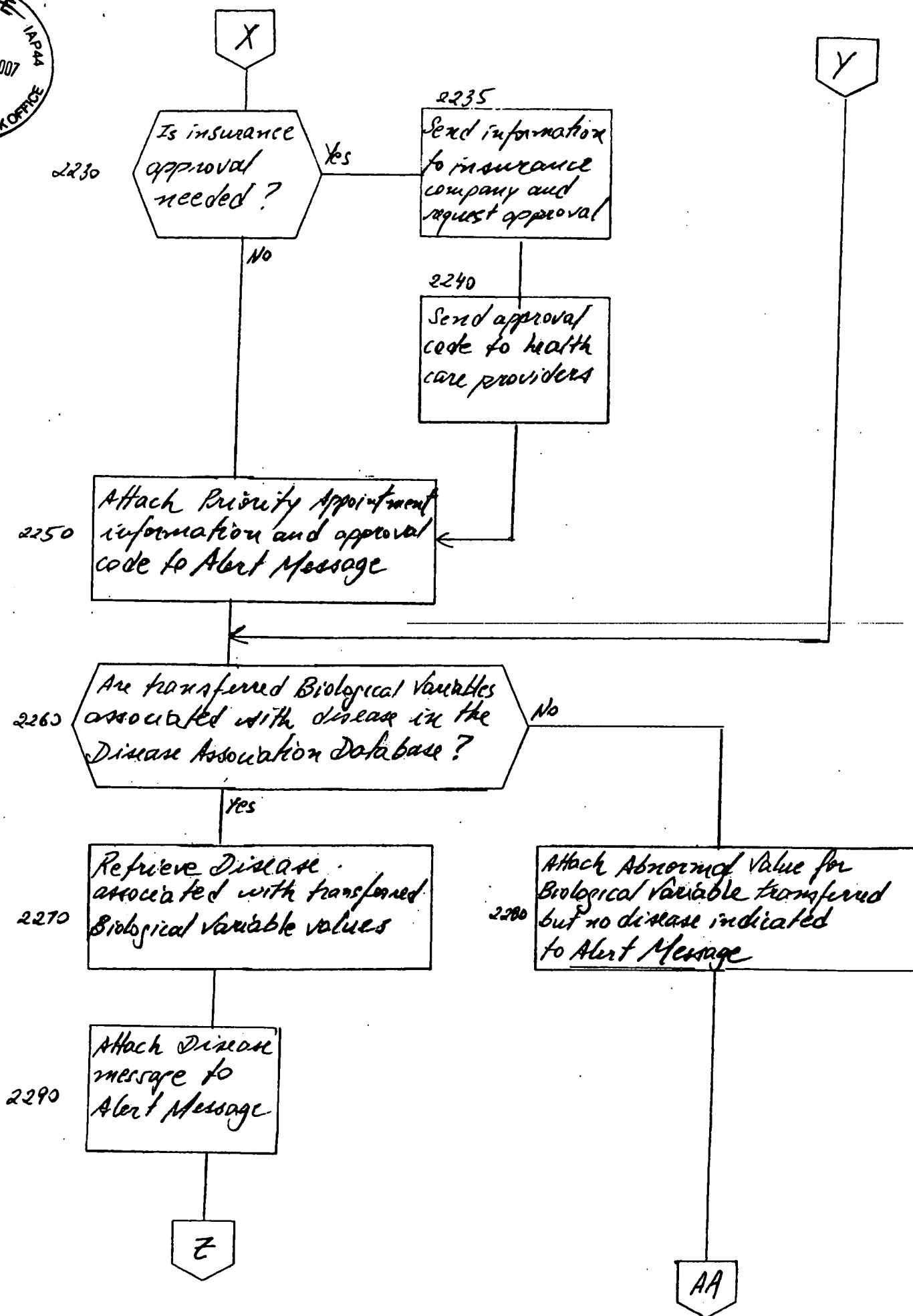
2160

Attach User instruction on timely monitoring to Alert Message

U

V







Z

2300

Retrieve the user's Product Identifiers from the user's Product Usage record in the User's Product Usage database

2310

For Product Identifiers at step 2300 retrieve Contra-Indication from Product Information database

2320

Do any Disease associated with Biological Variable transferred match Contra-Indication in Product Information database associated with Product Identifiers for the user in the User's Product Usage record?

No

Yes

2330

Attach to Alert Message Contra-Indication message associated with Product Identifier in the user's product usage records and Consult your doctor

2350

Contact doctor and inform about Contra Indication

2340

Attach "No Contra-Indication found between Product Identifiers and Biological Variables transferred" to Alert Message

2360

Repeat from steps 2300 to 2350 for Alert Database instead of Product Information database

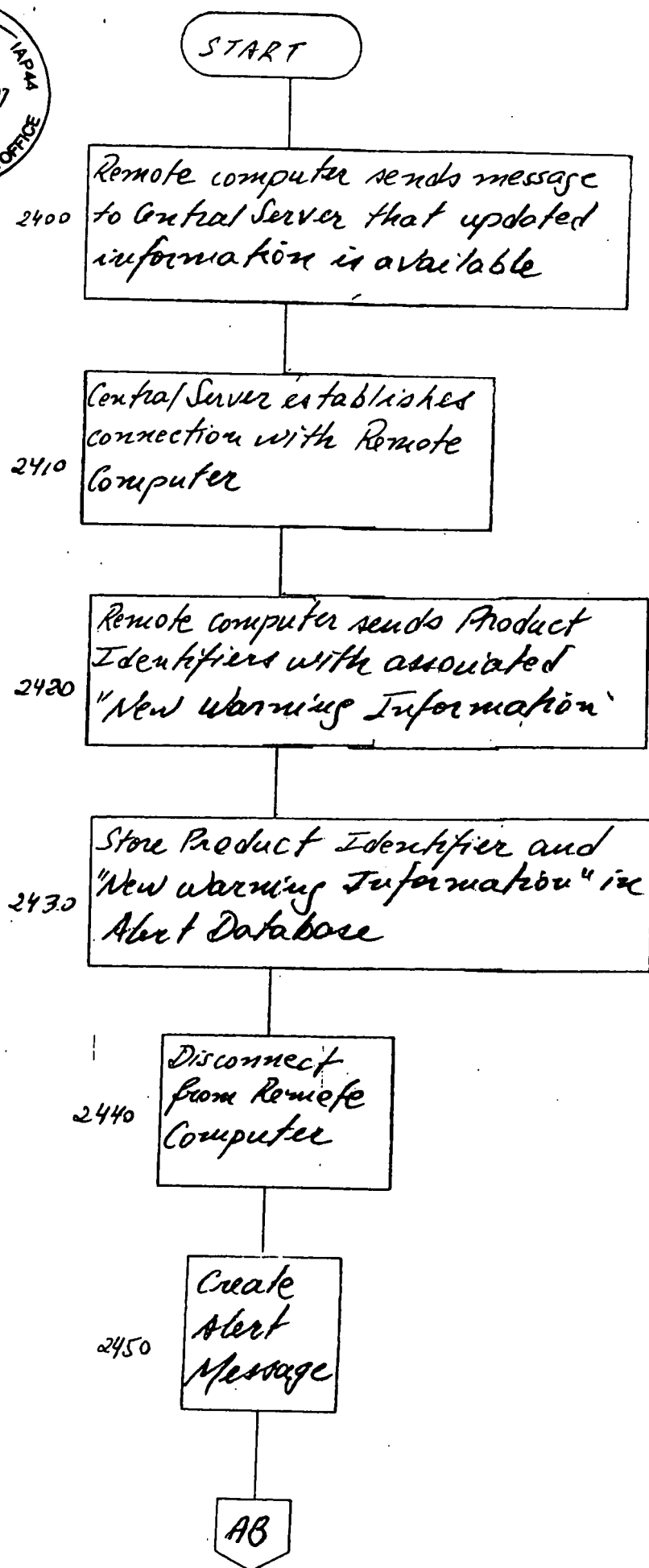
T

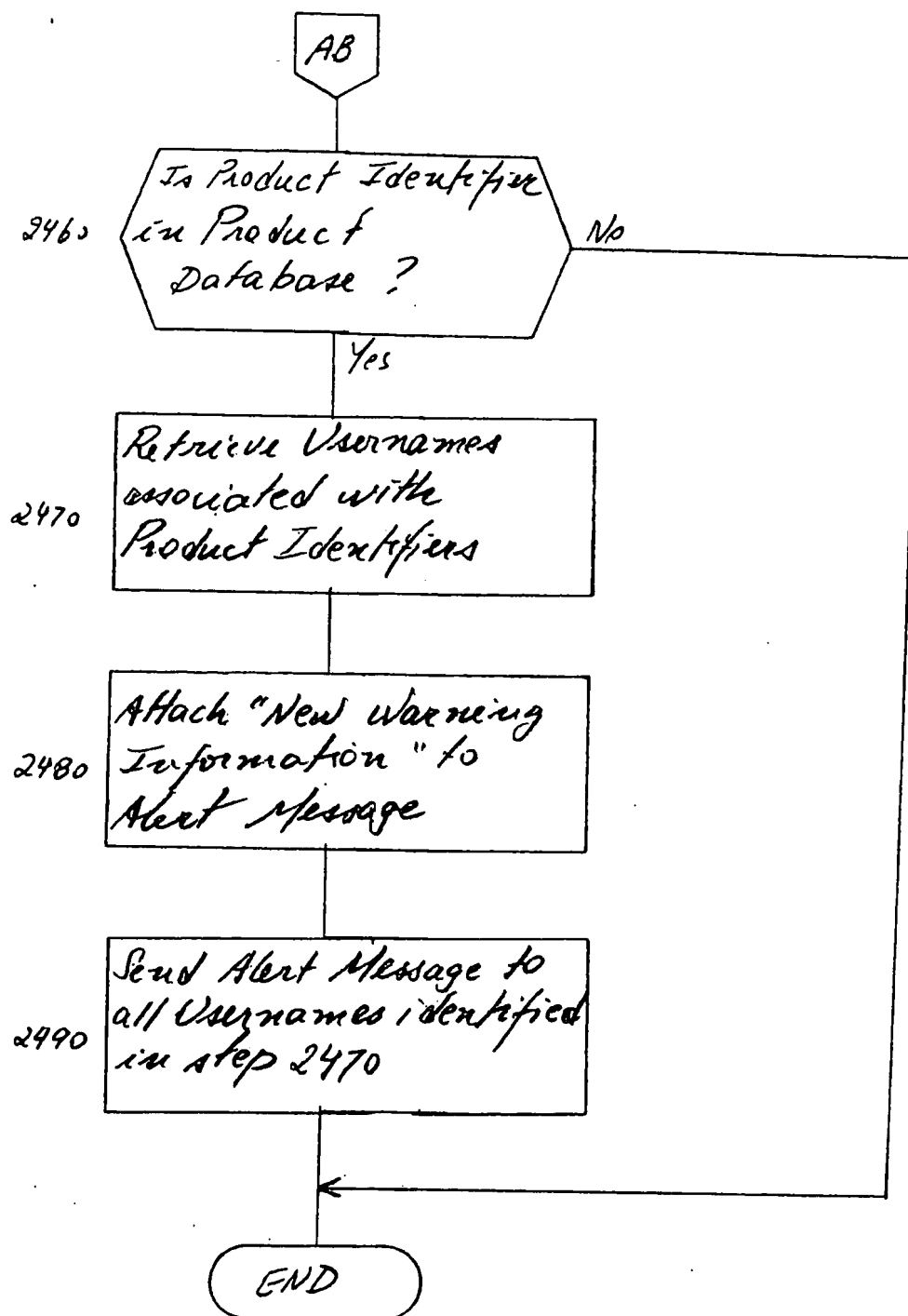
AA

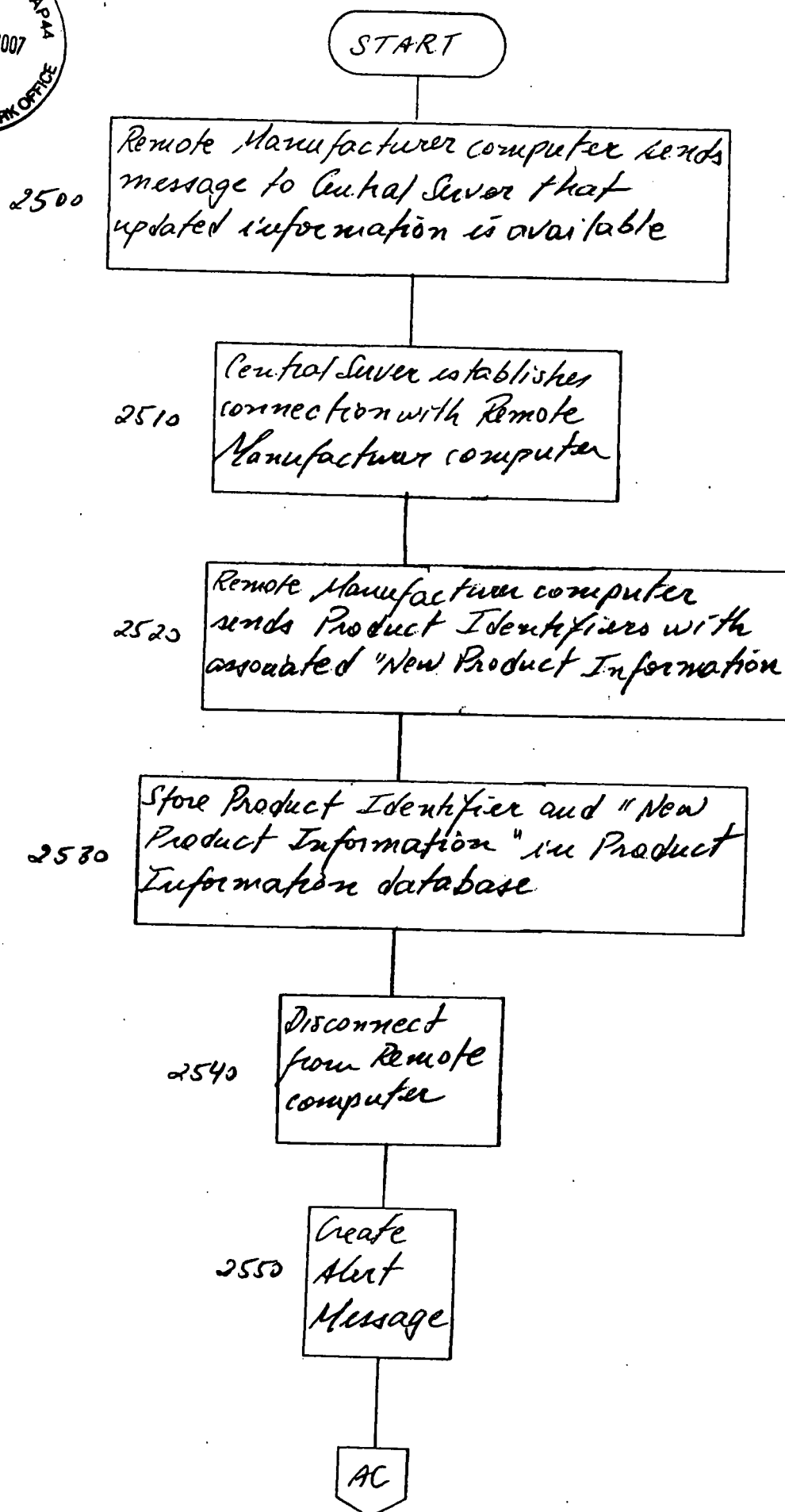
2370

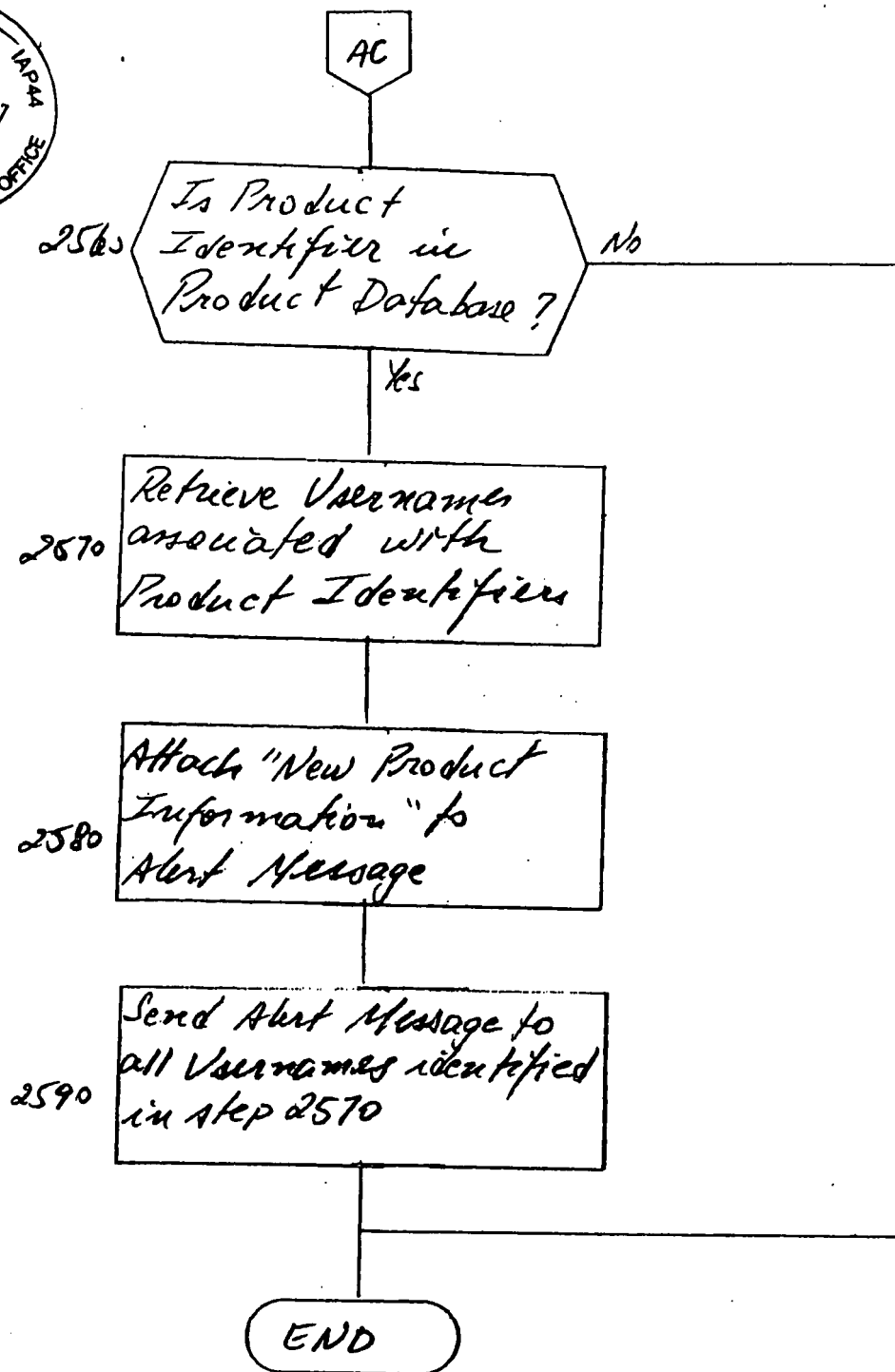
Send Alert Message

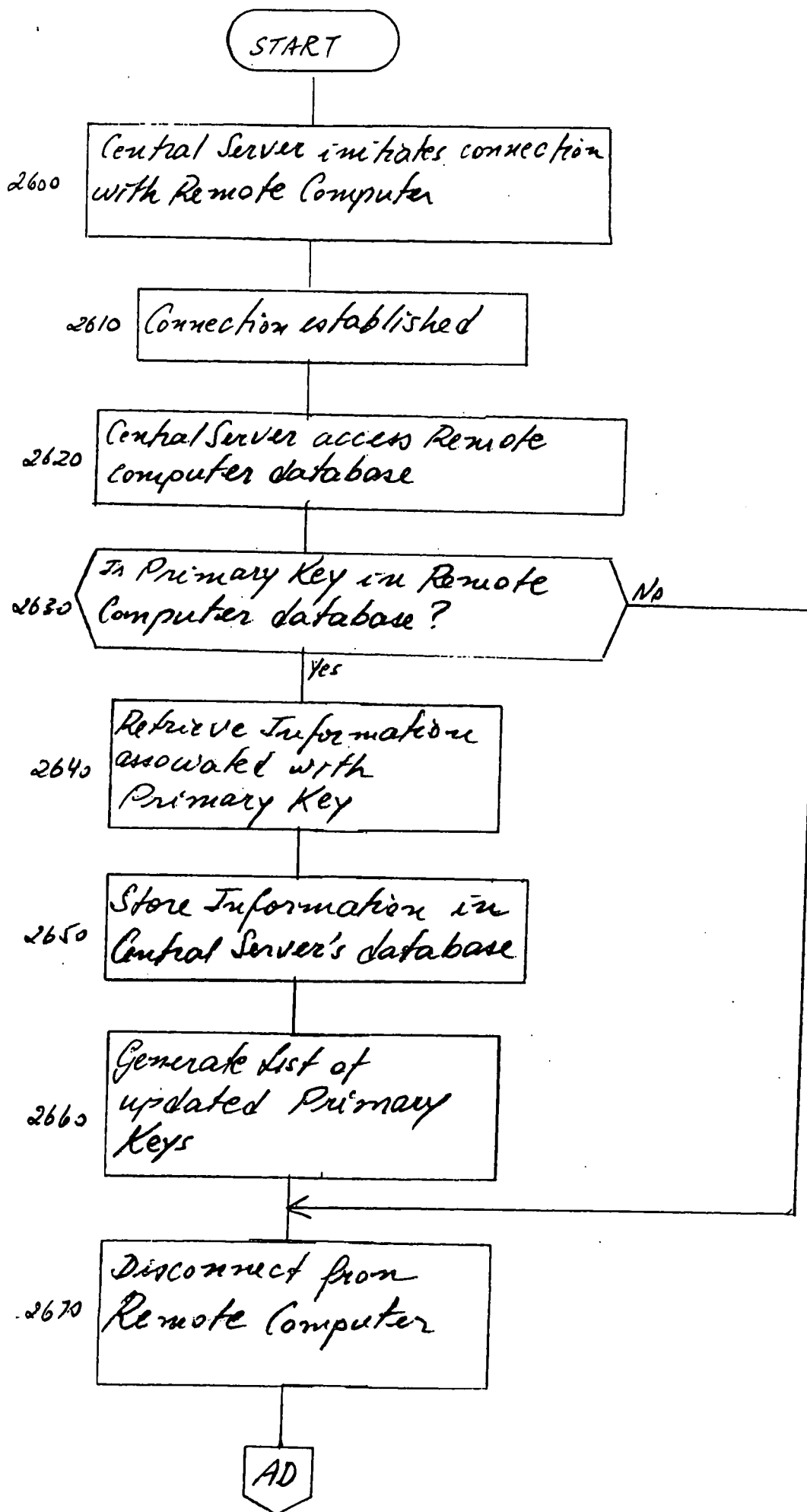
END

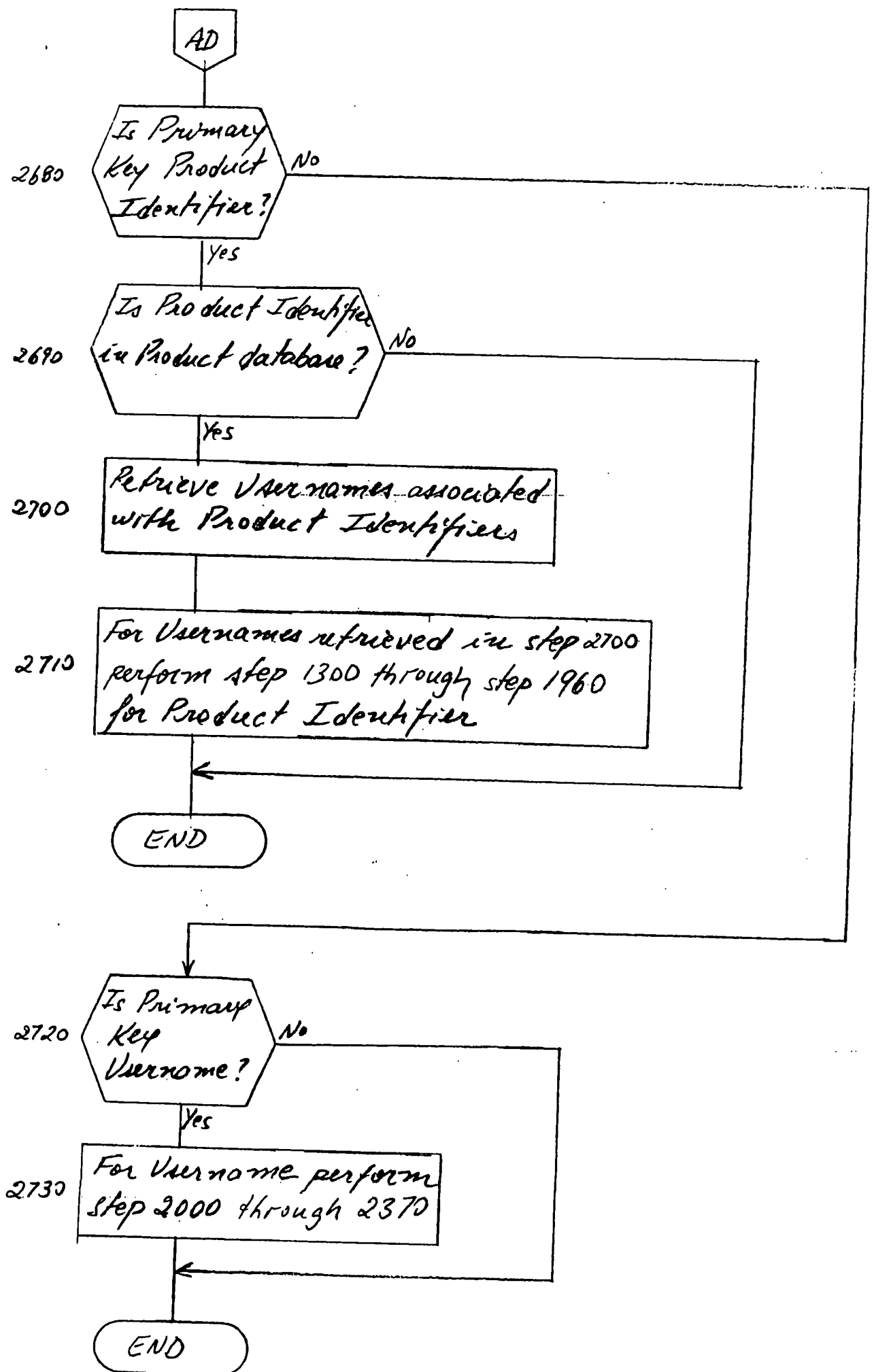


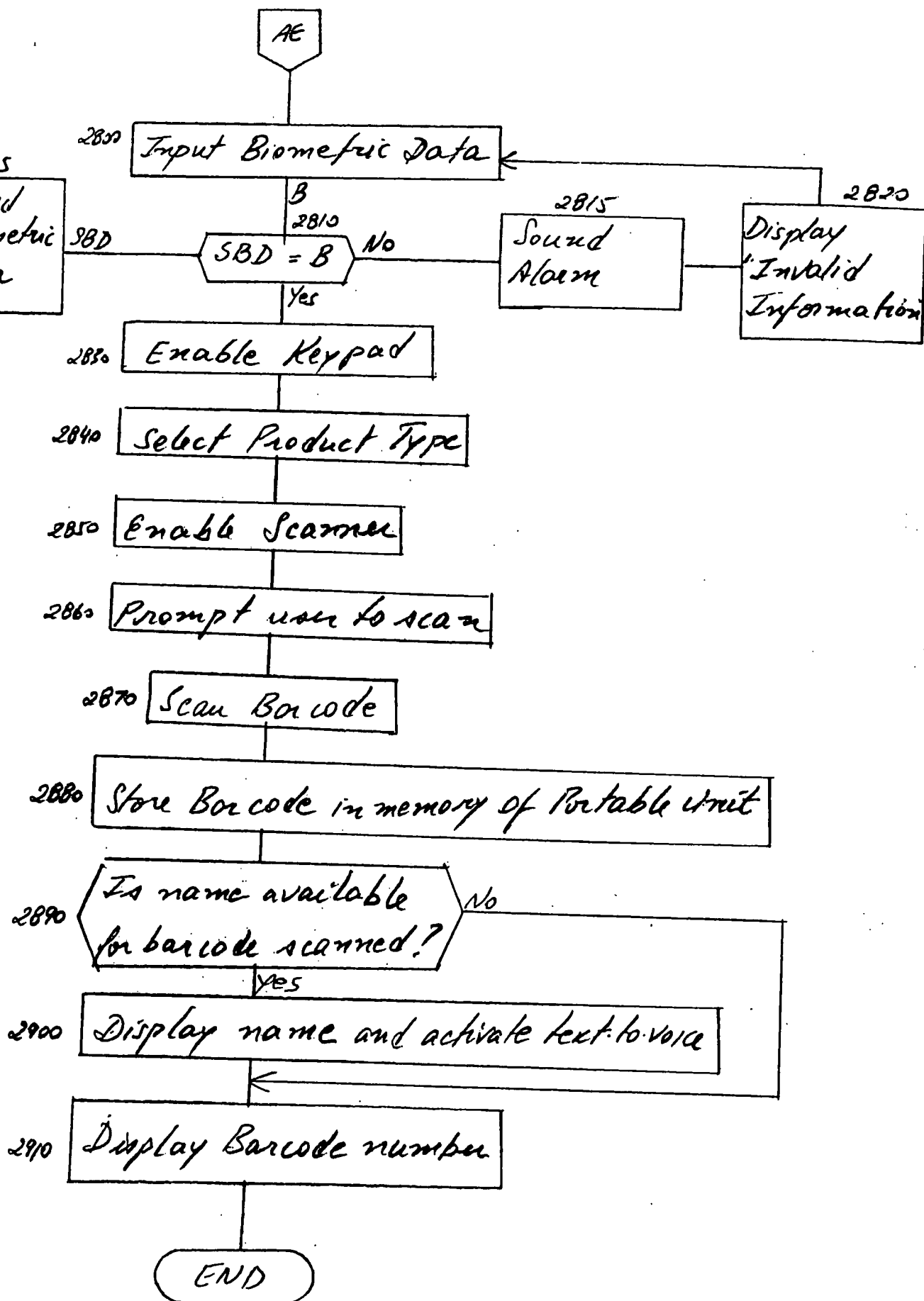


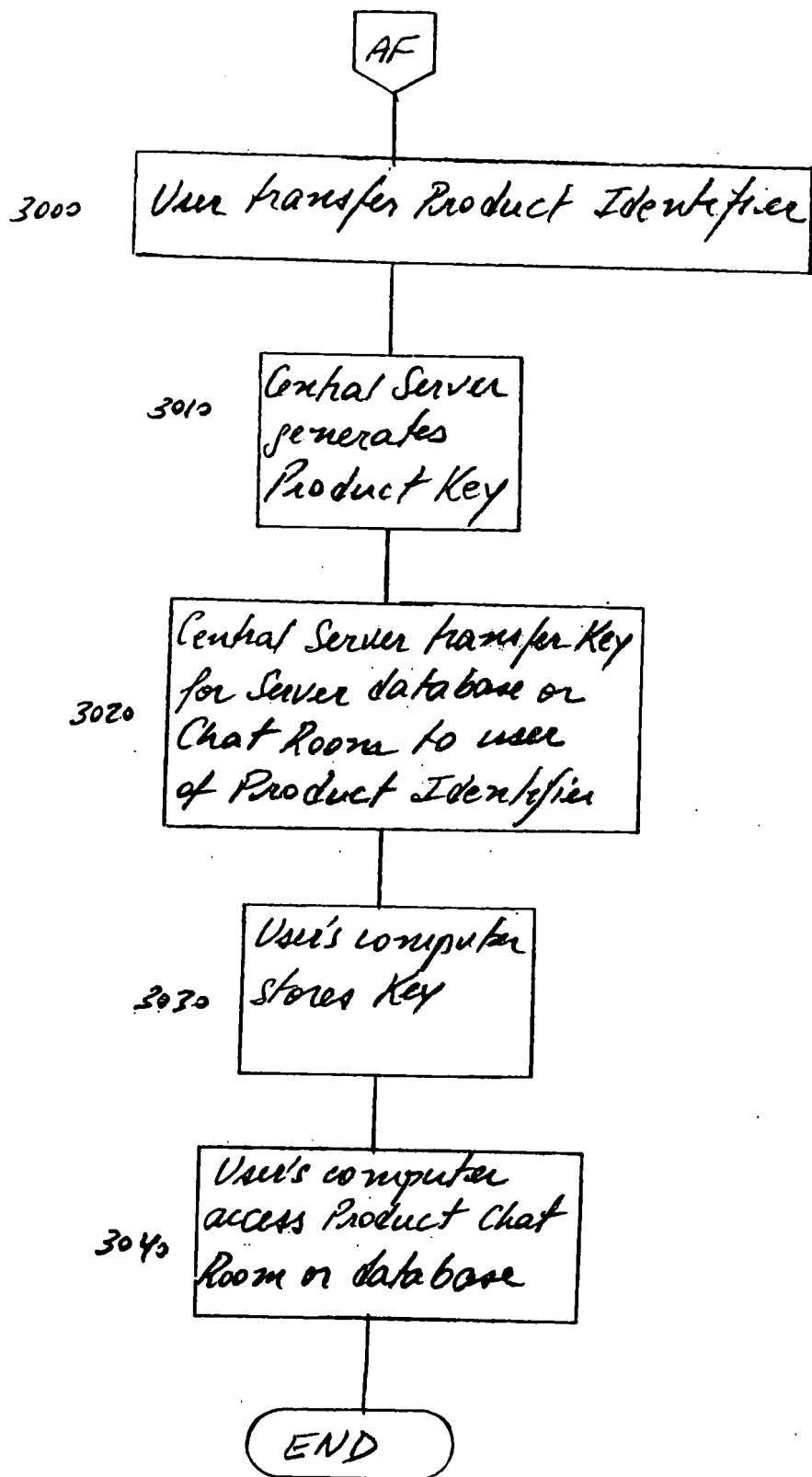


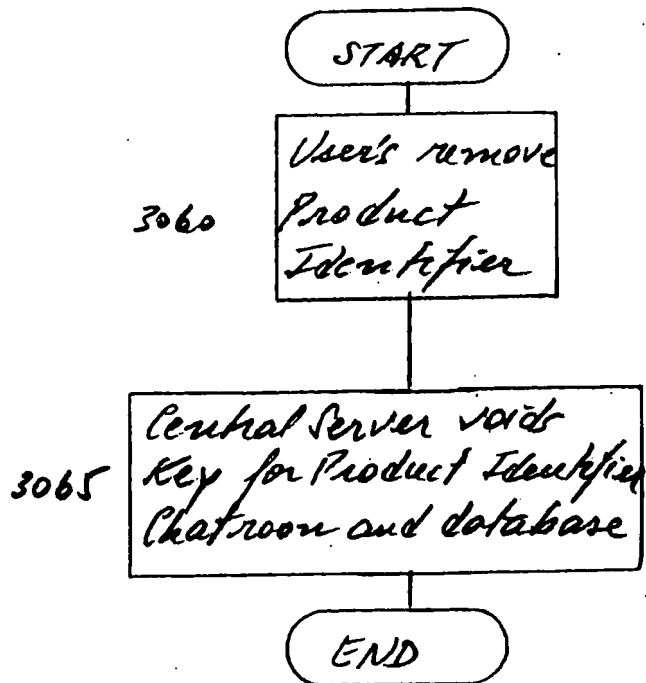
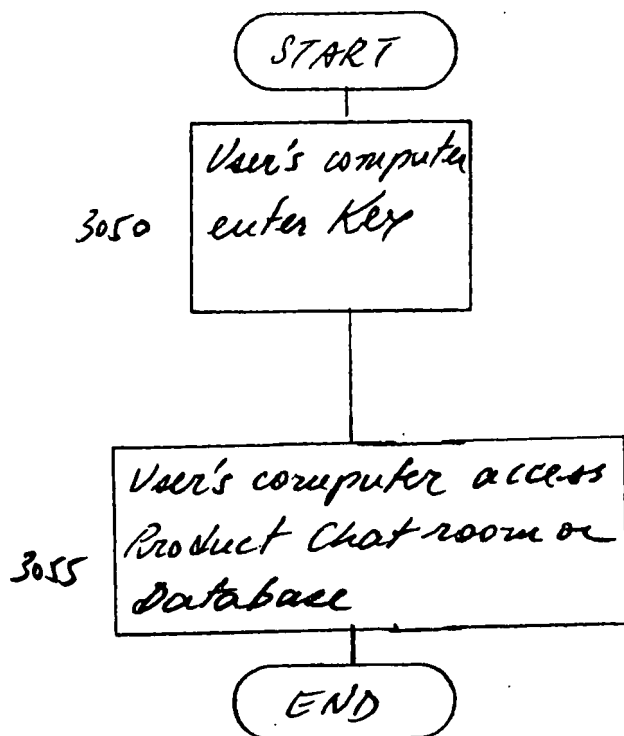


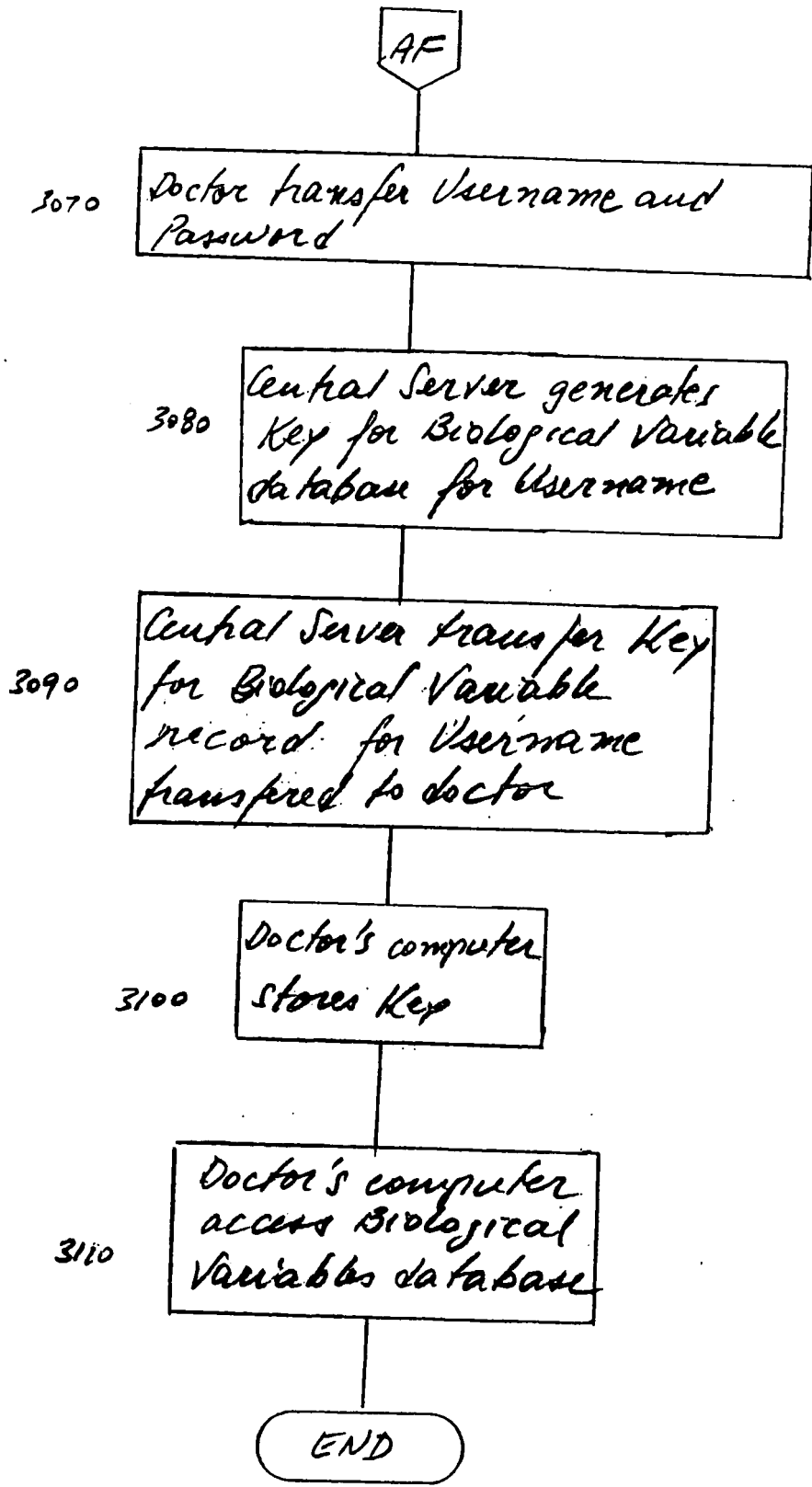


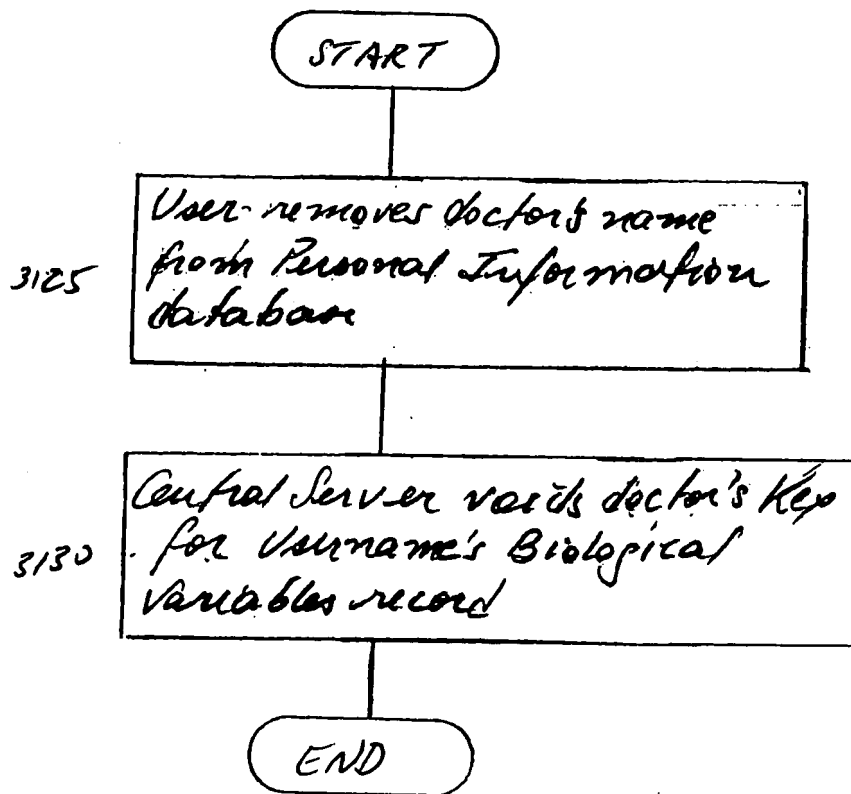
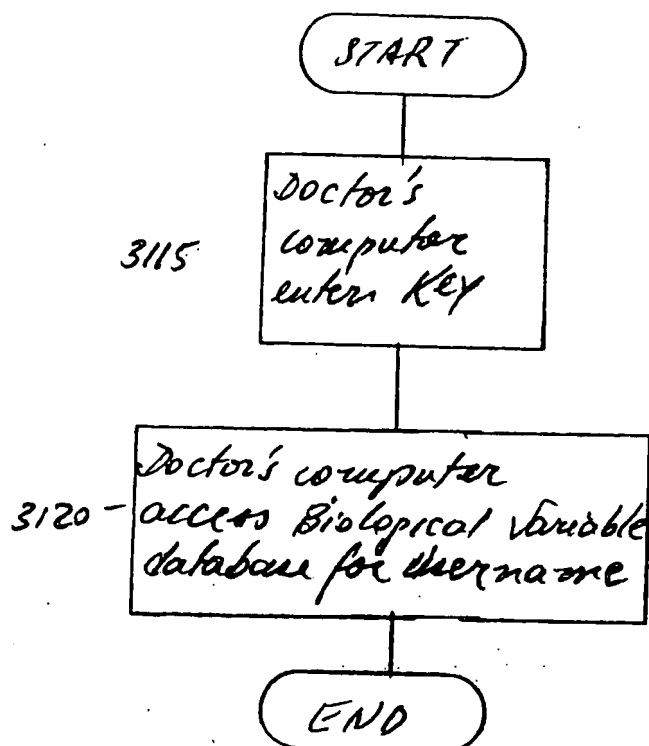


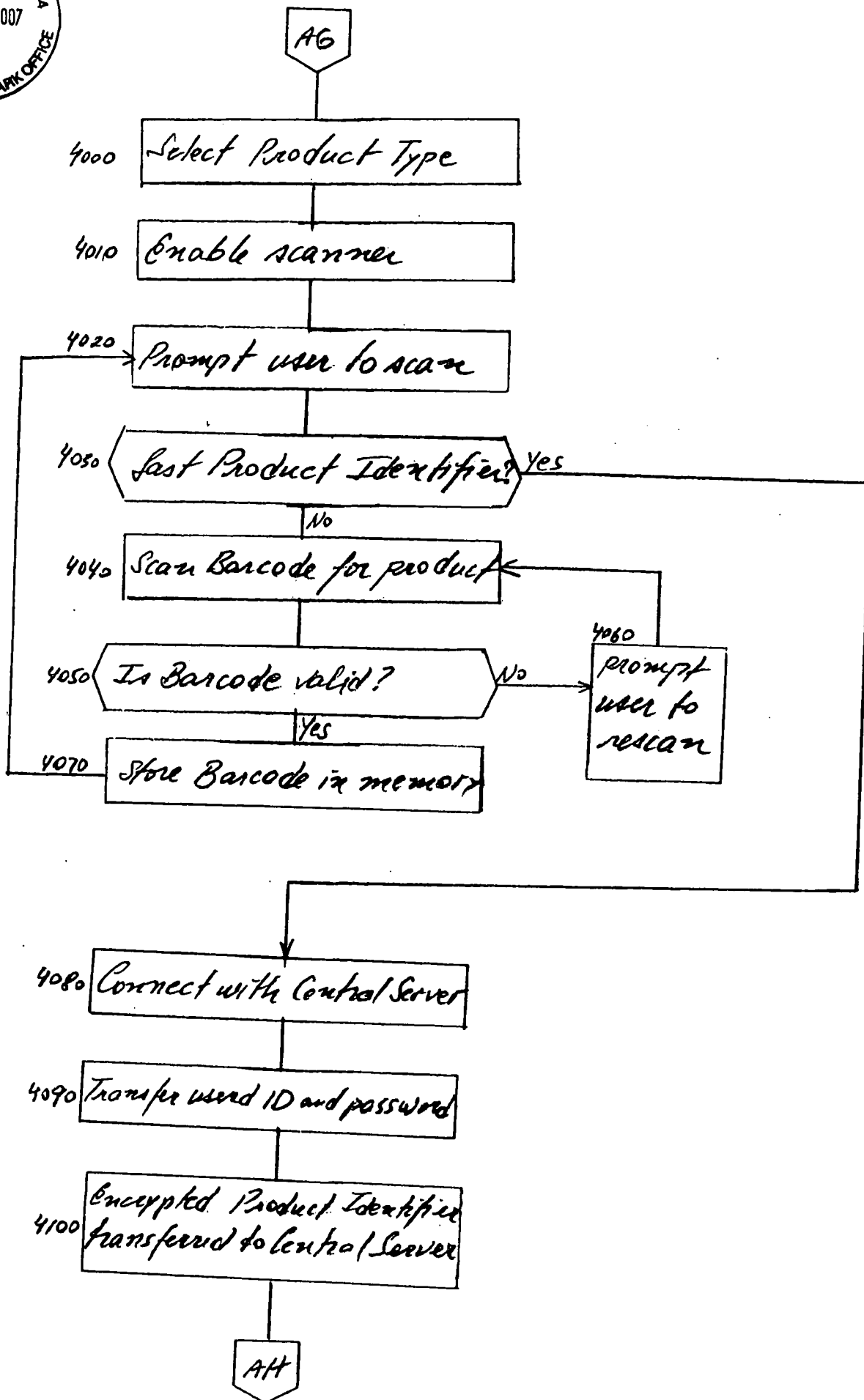


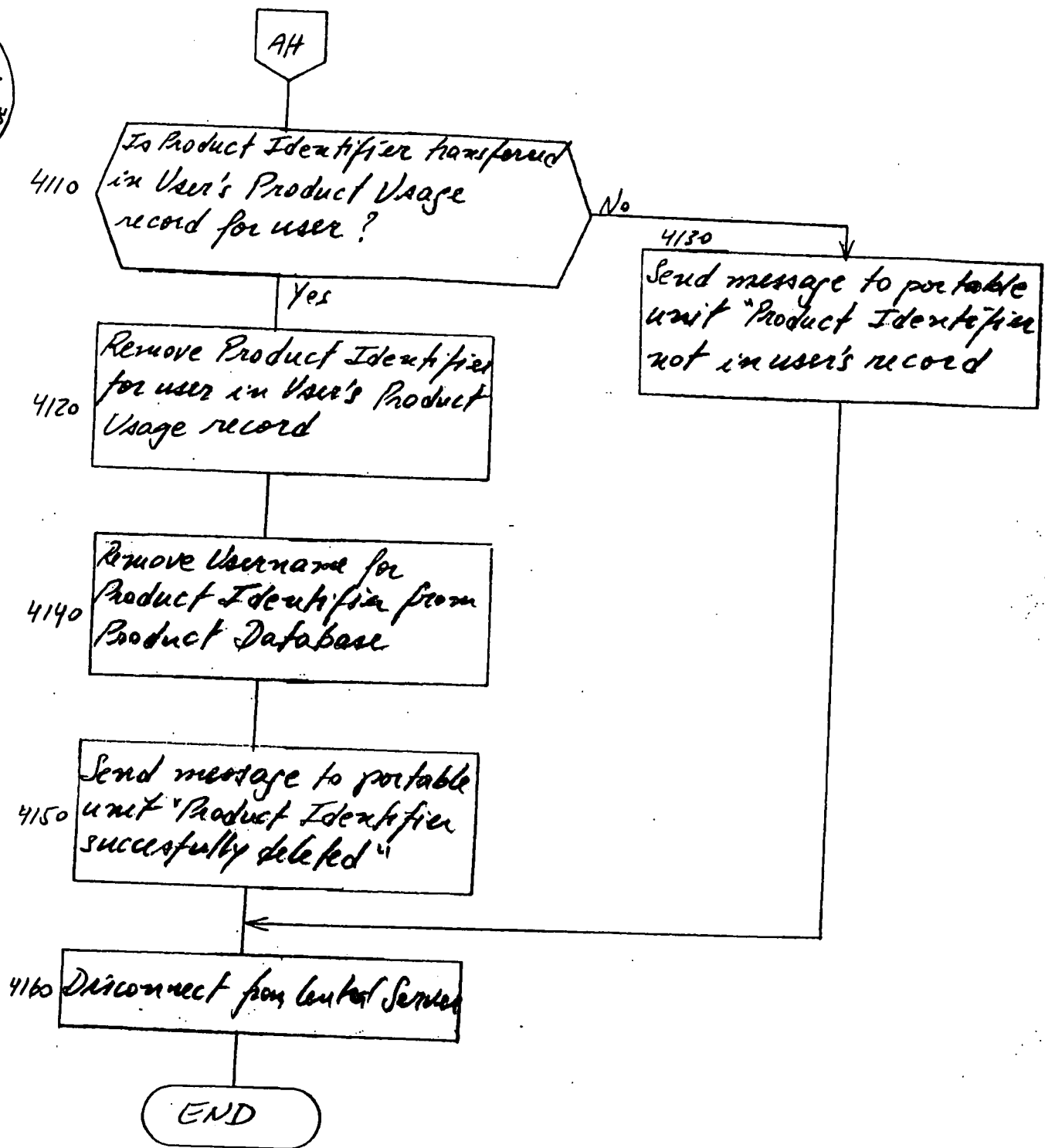


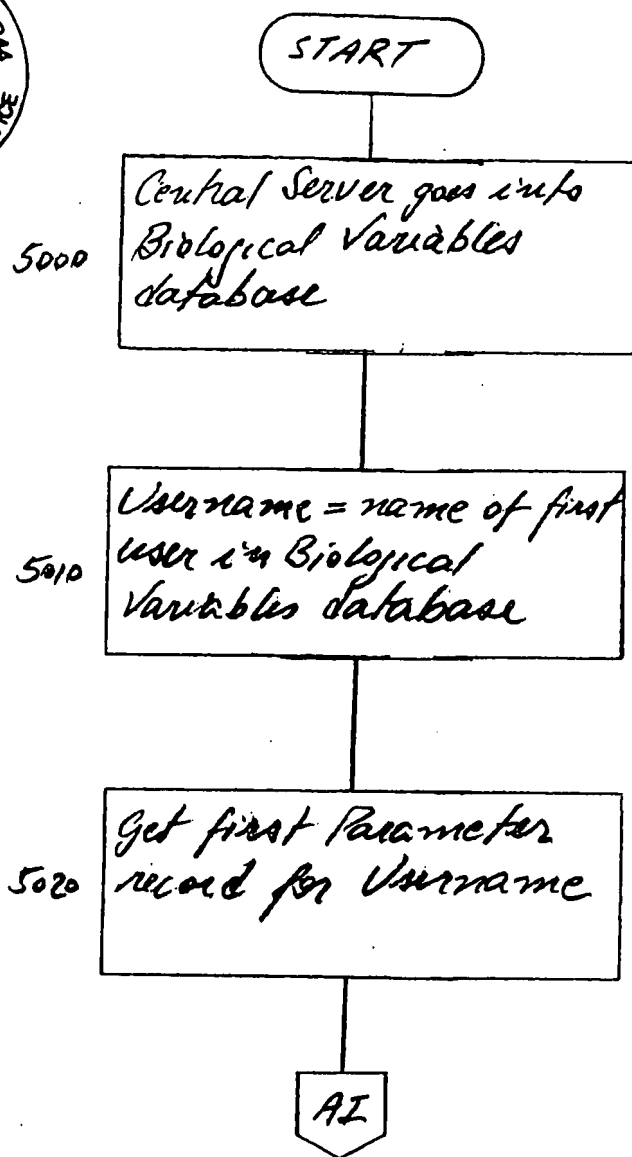














AI

5055

Send Message to user "Most recent Biological variable value is more than 1 year old"

5030 From Parameter record get first value and time/date

5040 Is today's time/date minus time/date greater than one year?

No

Yes

5050 Is value last value in Parameter record?

Yes

No

5060 Remove value and time/date from Parameter record

5070 From Parameter record get next value and time/date

5080 Is Parameter record the last Parameter record for Username?

Yes

No

5090 Get next Parameter record for Username

5100 Is Username last user in Biological Variables database?

Yes

No

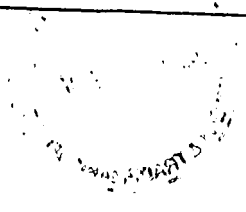
5110 Username = name of next user in Biological Variables database

5120 Go to step 5020

END

Database	Key	Example
1) PRODUCT DB ^{USAGE} DB ^{Record}	Product Identifier	1- Tylenol Identifier - ^{Craig} Marcio ^{Doug} 2- Advil Identifier - ^{Craig} Doug ^{Lillian} 3- Aspirin Identifier - ^{Craig} Deborah ^{Doug} Dotty ^{Marcio} 4- Mylanta - ^{Doug} Marcio ^{Pastor Barbara}
2) PRODUCT INFORMATION DB	Product Identifier	1- Tylenol Identifier: - contraindication: glaucoma Hypertension - side effects: liver disease 2- Advil Identifier contraindication: diabetes side effects: ulcer 3- Aspirin Identifier: contraindication: ulcer stroke side effects: bleeding 4- Mylanta contraindication: none side effects: cramp
3) User's PRODUCT USAGE DB ^{on record}	User name	1- Craig ^{Tylenol identifier} ^{Advil identifier} ^{Aspirin identifier} 2- Doug ^{Tylenol} ^{Advil} ^{Aspirin} ^{Mylanta} 3- Dotty - Aspirin 4- Deborah - Aspirin 5- Marcio ^{Tylenol} ^{Aspirin} ^{Mylanta} 6- Pastor Barbara - Mylanta

Database	Key	Example
PRODUCT DB	Product Identifier	1- Tylenol Identifier - Craig (Product Recall) Doug 2- Advil Identifier - Craig Doug Lillian 3- Aspirin Identifier - Craig Deborah Doug Dotty 4- Mylanta - Doug Marcio Pastor Barbara
PRODUCT INFORMATION DB	Product Identifier	1- Tylenol Identifier: CI field - contraindication: glaucoma Hypertension side effects: liver disease 2- Advil Identifier contraindication: diabetes side effects: ulcer 3- Aspirin Identifier contraindication: ulcer stroke side effects: bleeding 4- Mylanta contraindication: none side effects: cramp
USER'S PRODUCT USAGE DB	User name	1- Craig - Tylenol Identifier Advil Identifier Aspirin Identifier 2- Doug - Tylenol Advil Aspirin Mylanta 3- Dotty - Aspirin 4- Deborah - Aspirin 5- Marcio - Tylenol Aspirin Mylanta 6- Pastor - Mylanta

Database	Key	Example
1) INTERACTION DB 	Product identifier	<p>Injury / Illness</p> <p>Tylenol: and Advil = liver failure and Sudafed = heart attack and Aspirin = bleeding.</p> <p>Advil: and Tylenol = liver failure and Mylanta = headache and Aspirin = Glaucoma</p> <p>Aspirin: and Tylenol^{Tylenol} = Bleeding and Advil = Glaucoma and Excedrin = diarrhea and Mylanta = joint pain</p> <p>Mylanta and Advil = headache and Aspirin = joint pain</p>
2) BIOLOGICAL VARIABLES DB	user name	<p>Craig: eye pressure blood pressure blood glucose weight</p> <p>Doug: blood pressure blood glucose pulse temperature</p> <p>Mario: - eye pressure - cholesterol - temperature - weight.</p>

INTERACTION DB

Product identifier

example

Tylenol and Advil = liver failure
and Sudafed = heart attack
and Aspirin = bleeding

Product Interaction Field

in both

Prod. Info DB

and

Alert DB

add Hazard

degree for interaction field

add - Drug app. required for drug interaction

add Lab app. required for drug interaction

Sub Field

Warning message
Tylenol & Advil = liver failure

Advil and Tylenol = liver failure
and Mylanta = headache
and Aspirin = Glaucoma

Aspirin and Tylenol = Bleeding
and Advil = Glaucoma
and Excedrin = diarrhea
and Mylanta = joint pain

Mylanta and Advil = headache
and Aspirin = joint pain

ALL FIELDS HERE
MUST BE in both Prod. Info
& Alert DB

BIOLOGICAL VARIABLES DB

user name

1-parameter

2-value

3-Time/date entered

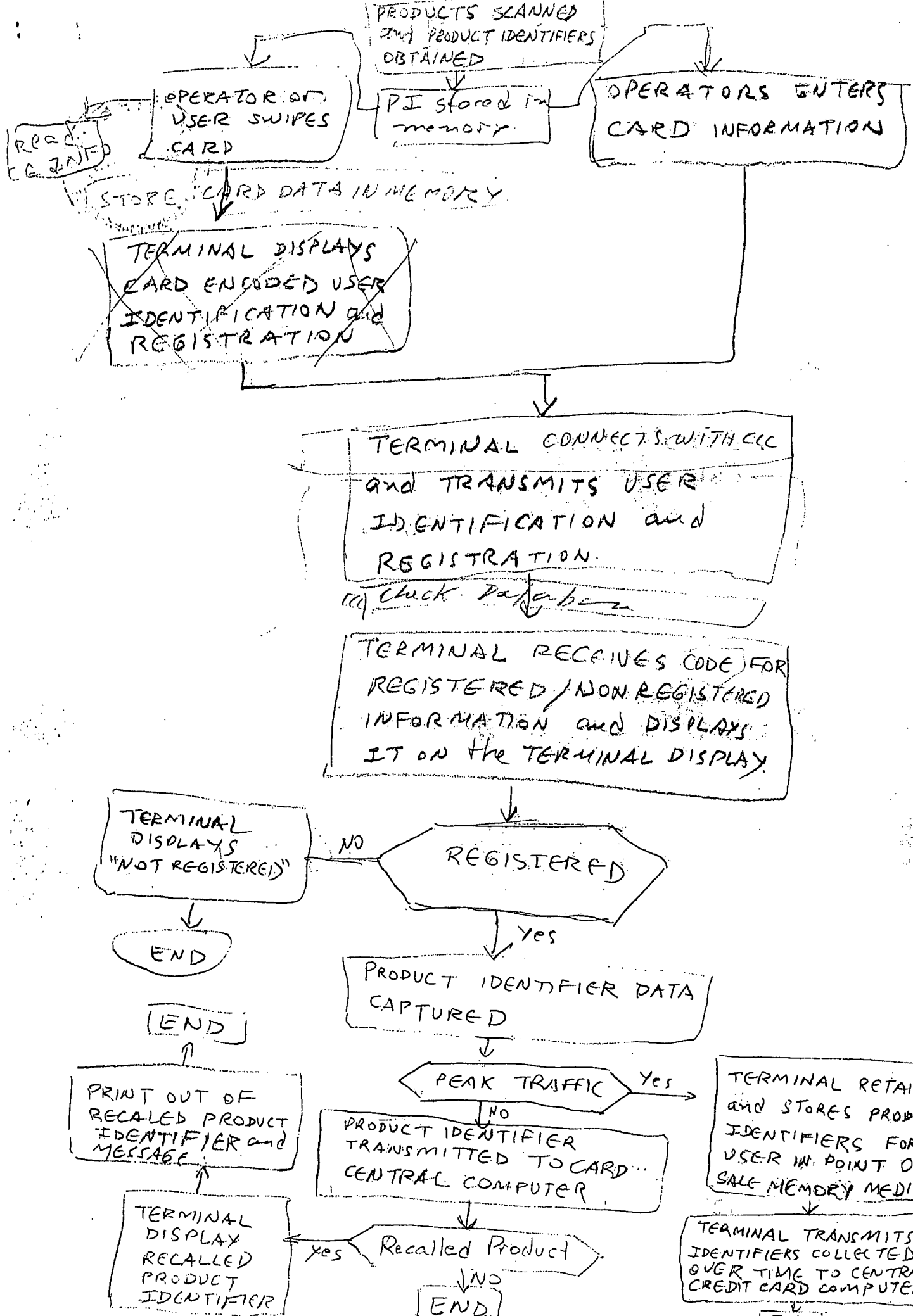
parameter value
Craig - eye pressure - 10
blood pressure 120/80
blood glucose 300
weight

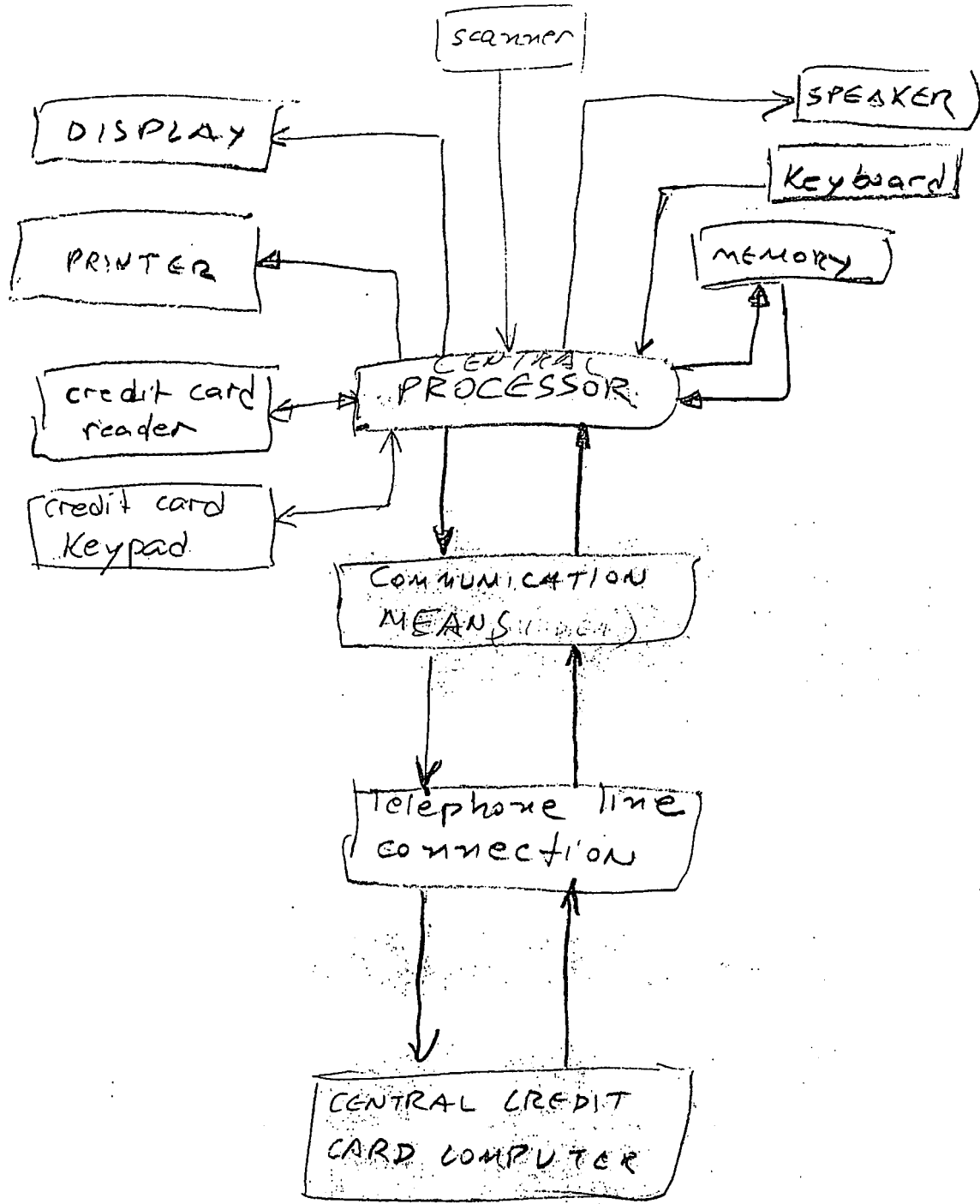
Doug - blood pressure
blood glucose
pulse
temperature

Mario - eye pressure
- cholesterol
- temperature
- weight

Database	Key	Example (3)
DISEASE ASSOCIATION DB.	Biological variable	<p>↑ <u>eye pressure</u> = glaucoma</p> <p>↑ <u>blood pressure</u> = hypertension</p> <p>↑ <u>blood sugar</u> = diabetes</p> <p>↓ <u>red blood cells</u> = anemia</p>
User's PERSONAL INFORMATION DB.	Username	<ul style="list-style-type: none"> - Name, address, occupation - Date of birth, Place of birth - Doctor's information - Insurance information - Laboratory information - Range of normal biological variables - Monitoring period - timely - Hazard with untimely monitor - Inform Dr. of abnormal value
ADVERT ALERT DB	Product Identifier	<p><u>Tylenol identifier</u></p> <ul style="list-style-type: none"> - cause stomach cancer in Asians - decrease blood pressure in Blacks - decrease cholesterol in diabetics <p><u>Aspirin identifier</u></p> <ul style="list-style-type: none"> - causes ulcer in 90% of users according to FDA. - decrease liver enzymes in blacks <p><u>Aspirin</u></p> <ul style="list-style-type: none"> - decrease heart attack in whites and blacks over 50 - causes joint deformity when used with Valium.

DISEASE ASSOCIATION DB. expert system purchased update by seller.	Biological variable	Disease name ↑ eye pressure = glaucoma ↑ blood pressure = hypertension ↑ blood sugar = diabetes ↓ red blood cells = anemia
User's PERSONAL INFORMATION DB.	Username Password	Name, address, occupation Date of birth, Place of birth Doctor's information Insurance information Laboratory information Range of normal biological variables Monitoring period - timely a hazard with untimely monitoring Information of abnormal value Current illnesses Pharmacy information
Alert DB Name of med. Is prescription required Message: Direction; alternative drugs Hazard degree for each product may be more than 1 Alert level Field 6: Hazard degree for CI field Field 7: Hazard degree for Alert info Field 8 or app required 9 Lab " " / CI	Product Identifier Field 2 is Alert level (product alone for portable unit) Field 3 need contraindication Field 4 need product interaction Field 5 Hazard degree (prod-med)	Alert Info (Field 1) Tylenol identifier causes stomach cancer decrease blood pressure in blacks decrease cholesterol in diabetics Aspirin - decrease heart attack in whites and blacks over 50 - causes joint deformity when used with Valium

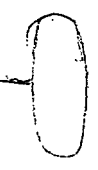




Based on PA, RP,

Each Message is based on,
 PSECE PI RE

USCERS

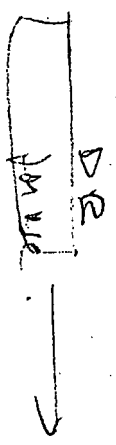


search PSECEPI

DB for Pa

couple.

Label ↓



when using msg. identify what
 characteristics of the product
 recalled / or replaced match
 user characteristics. Ex. Psev.
 improving message recall

→

↓

USCER P.I. DE

RECEIVE DISCRETS

↓

Based on

Informant

on the

Package.

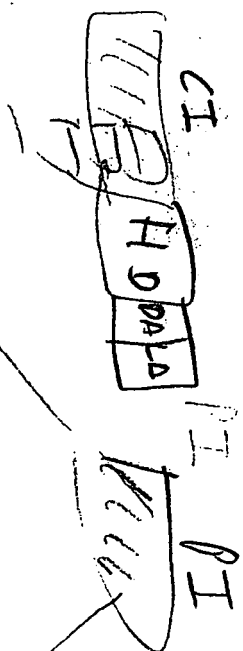
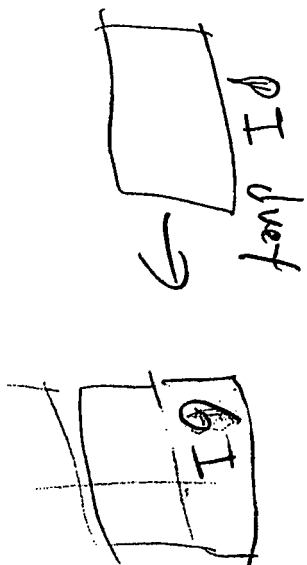
Name FILE Product

SM also can be based

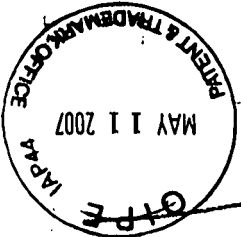
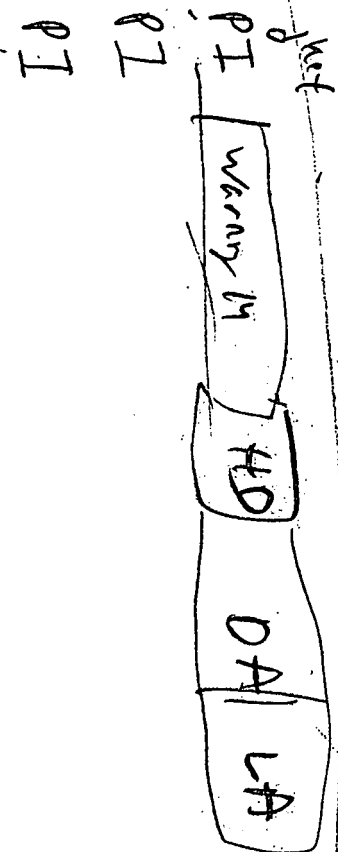
on RA & RP.



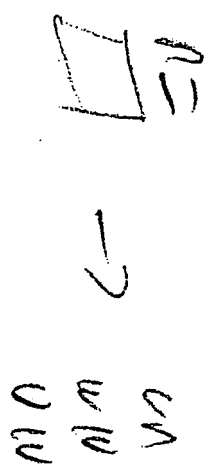
Product: IAP/0 W/P



Product Inter Action



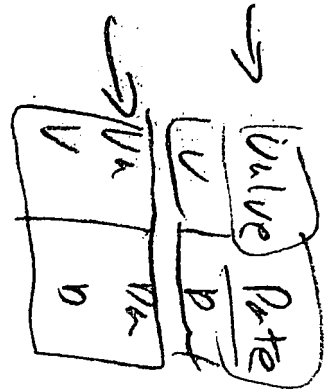
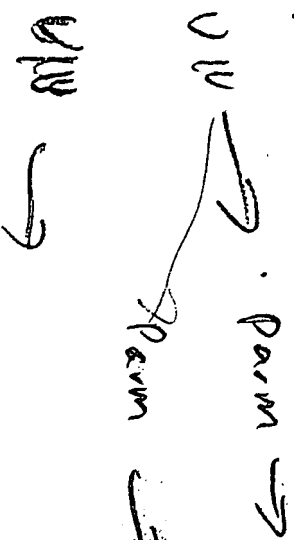
Product u_n

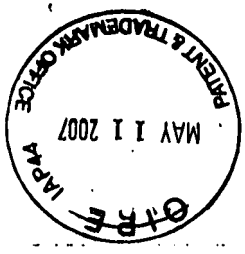


USAGS

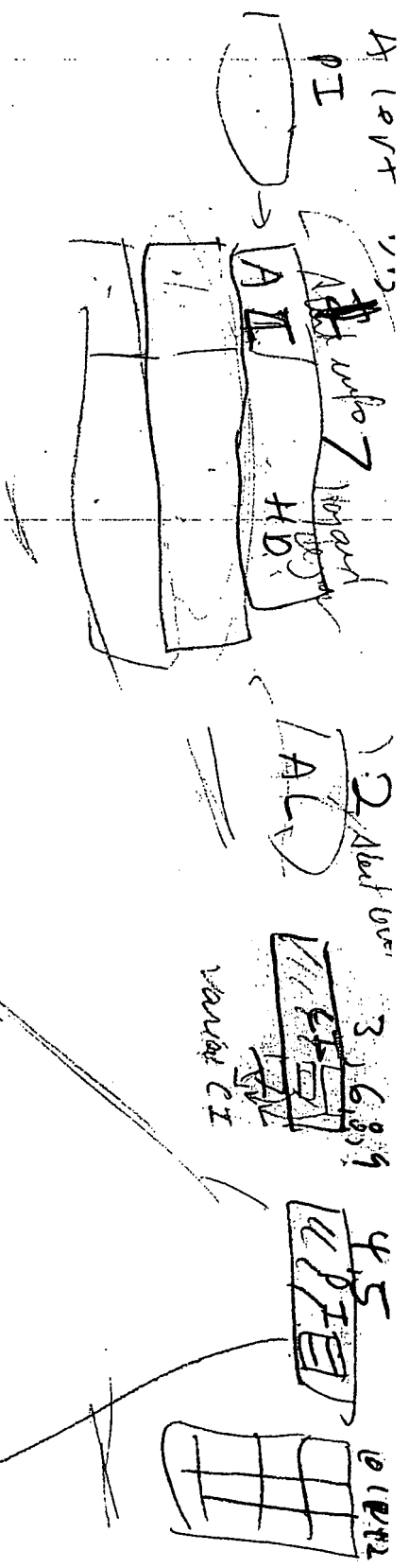


Hydrological v DB

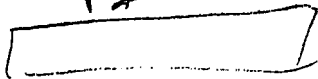




1



Alert BB
PI



USEA'S

UW	→	□	□	□	□	□	□	□
UW	→	□	□	□	□	□	□	□



- 10 - central server
- 20 - remote comp.
- 30 - computer system
- 40 - portable unit
- 50 Health Monitoring device
 - 52 - self test
 - 53 - NI
 - 54 - Tm
 - 55 - DP
 - 56 - Wgh
- 60 - RIS
- 70 - Provider of health assessment
- 90 - Jm
- 100 - Internet
 - 92 - username
 - 110 - VPI - u called / H: 111
 - 102 - Internet link
- 150 - Radio development

220 - 120 BV

FDA - 130
↓

Product Info.
Auto del: 160
- Insurance exp

PO: 6KXKX

Alert message.

Assoc: 6I
BV: 66.
BVNL 64

drug,

Ham: 6AJ
B = 6P
R: 6AP

- Keyboard: 15 9P
- display: ~~25~~ 22
- interactive device ~~20~~ 2.
- convert comm. interface: 25
- firewall 31
- keypad 12
- wand reader 14
- wireless input 16
- wired 18.
- 24 private connections when
- CS - DB - 20P memory medium

19 - print to network

D: A Feed: D
C: B MD: E
Baby: C MIST: F

Interfa: D: 6J.
Prode: F: 6K.
BV
C: 6L
MD: 6M

Available MEMBER

(2)

START

Is Product
re Call Amount?

Generate
PARTICIPANT CO.
Database
Subroutine

This is called for
each CO, in
my DB.

Can Recall Amount be
provided by MEMBER CO

Send Provider
- GONGANMENT
Amount

ALERT!

WILL RP

NO RP
message
used

Can Non Member
CO provide RP
message

USE
NON-M.
CO RP
MSG

USE Recall Amount
CO AMOUNTMENT
and store their name
or provider

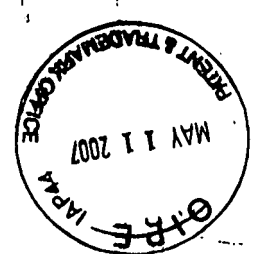
DOES Recall
Amountment
have RP?

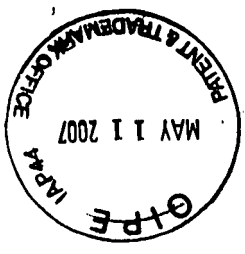
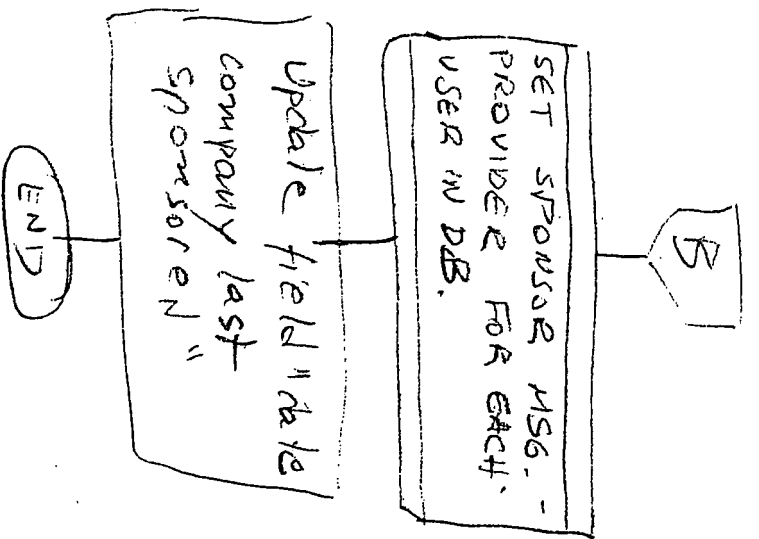
Can Member
CO offer
Replacement
Product?

USE MEMBER CO
RP message

USE RP message
amountment Prov.
in stored RP's
name as provider

STORE
PROVIDER'S
NAME





Does the user have ^{AN} ~~AN~~ DISPOSE our product in their user record?
 No (END)
 YES - SET SPONSOR MSG PROVIDER 4

For this user's record, does user have any of the diseases listed by the Recall Announcement Provider?

Yes: Send ^{Safety} Alert, MSG using R-Am; Provider's Sponsor MSG

Change Message Providers.

Replace Prod Provider?

Yes: Send SA msg using Repl. Prod. Provider Sponsor MSG

Change msg PROVIDERS

Any Member Co in Participant Co-DB

Yes: send SA msg using Member Company's Sponsor MSG

Change MSG PROVIDERS

Any Non-Member Co

Non-Member Co

Change MSG PROVIDERS

Send Message without SPONSOR MSG

END

5

Sorting Participant Co. DB to find best MS sponsor.

Give chance (priority) to Companies whose prod. is to recall
when equal - " priority to co. which sponsored longest ago
" " " which enrolled first.

$I = 1$
 $J = Z$

is Member Company I's
Product directly related
to recall product?

Y

Is Member Company J's
product directly related
to recall product.

N.

C

N

Is Member Co J's
product directly
related to recall product

Y

Swap data
for Company
I and J

C

Y

Who company I
sponsored a msg,
more recently
than J

No

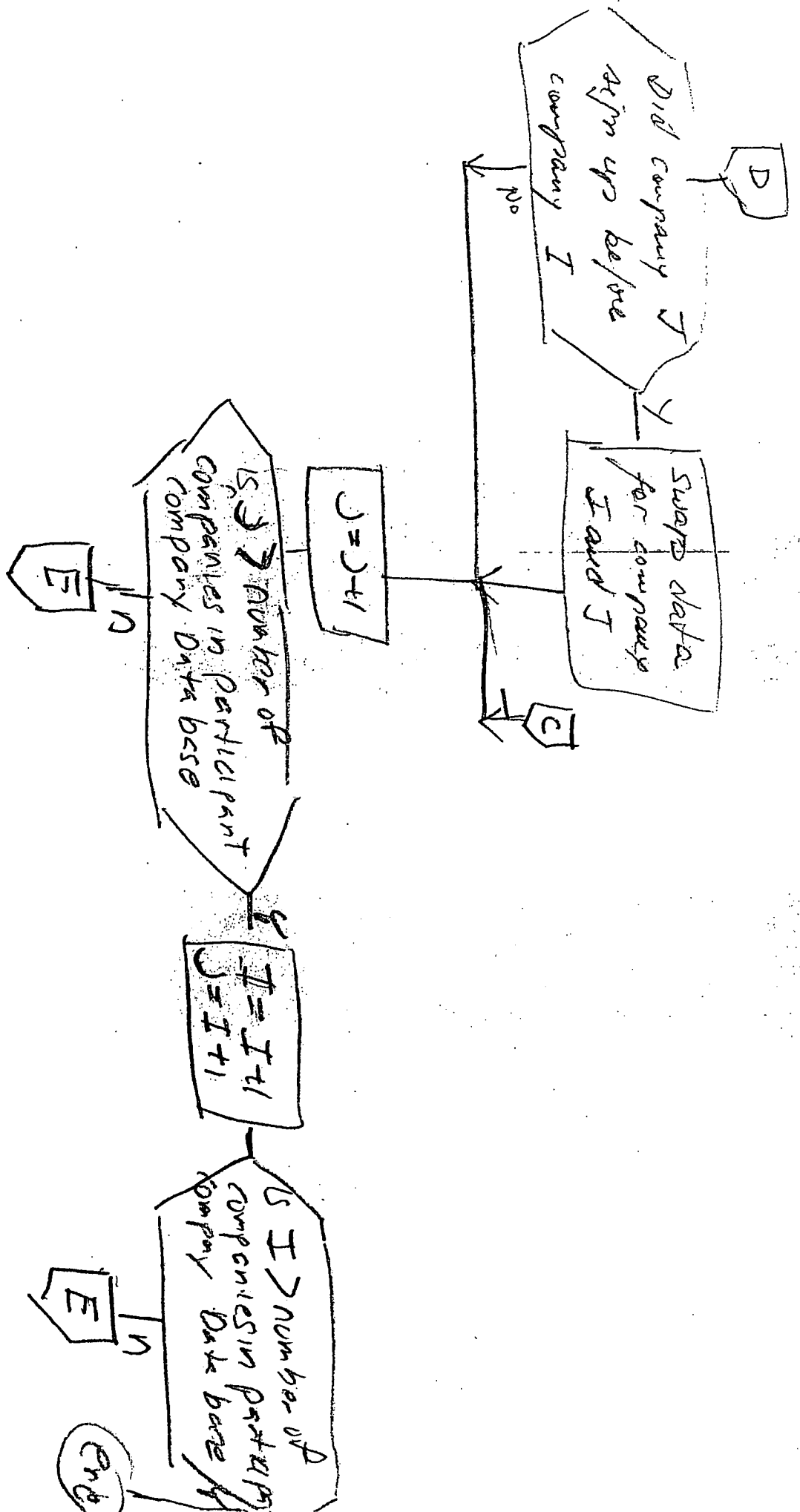
Was company J
sponsored a msg.
more recently than I

Y

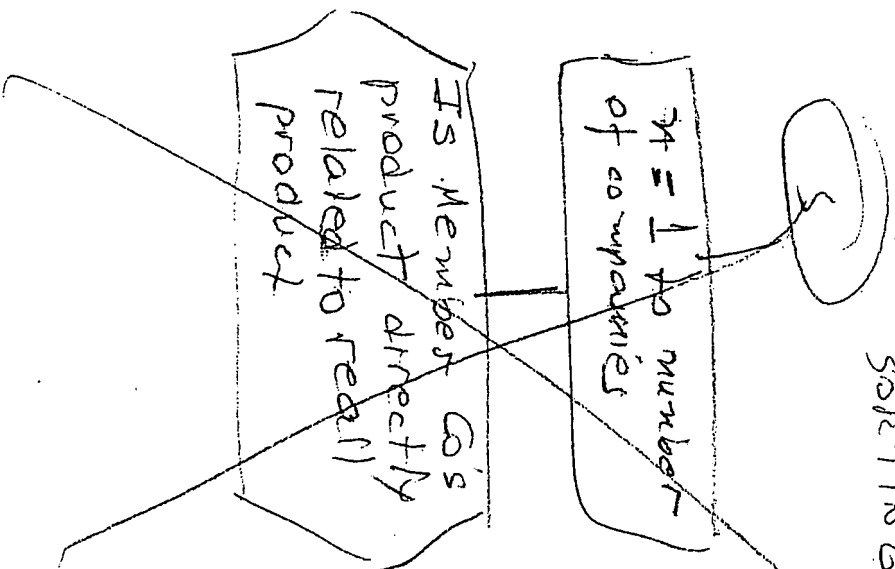
C

D





SORTING PARTIES CO'S



3 criteria - Related is greater than non-related

- sponsor more recently is less than sponsor long ago
- sign up early is greater than signed up late

3 criteria

Rel → Top

Non → Bottom

who / Recently

lost / back in

signed / when signed up



RECORDS: increase up of records
 RECORD: collection of info on a company
 Field: various info on the company.

MEMBER CO.

COMPANY & PRODUCT

COMPANY A - PRODUCT A

" A - " B

" A - " C

" B - " A

" B - " X

3 field,

MISC RECORD

MISC RP

MISC SM

RP,

COMPANY PROD Related dis/products

(Diabetes drug)
 recalled drug
 " " caused in

To provide RP msg.

RP is det by in dis/products that the recalled prod-is related to
 SMfield is det by the dis/products that the user has inputted (check off box in procedure)
 Recall MSG " " product being recalled

SM

COMPANY PROD. related to dis/product of the user
 TO PROVIDE SM

DATE COMPANY
 LAST PRODUCED
 MSG

Enrollment
 DATE

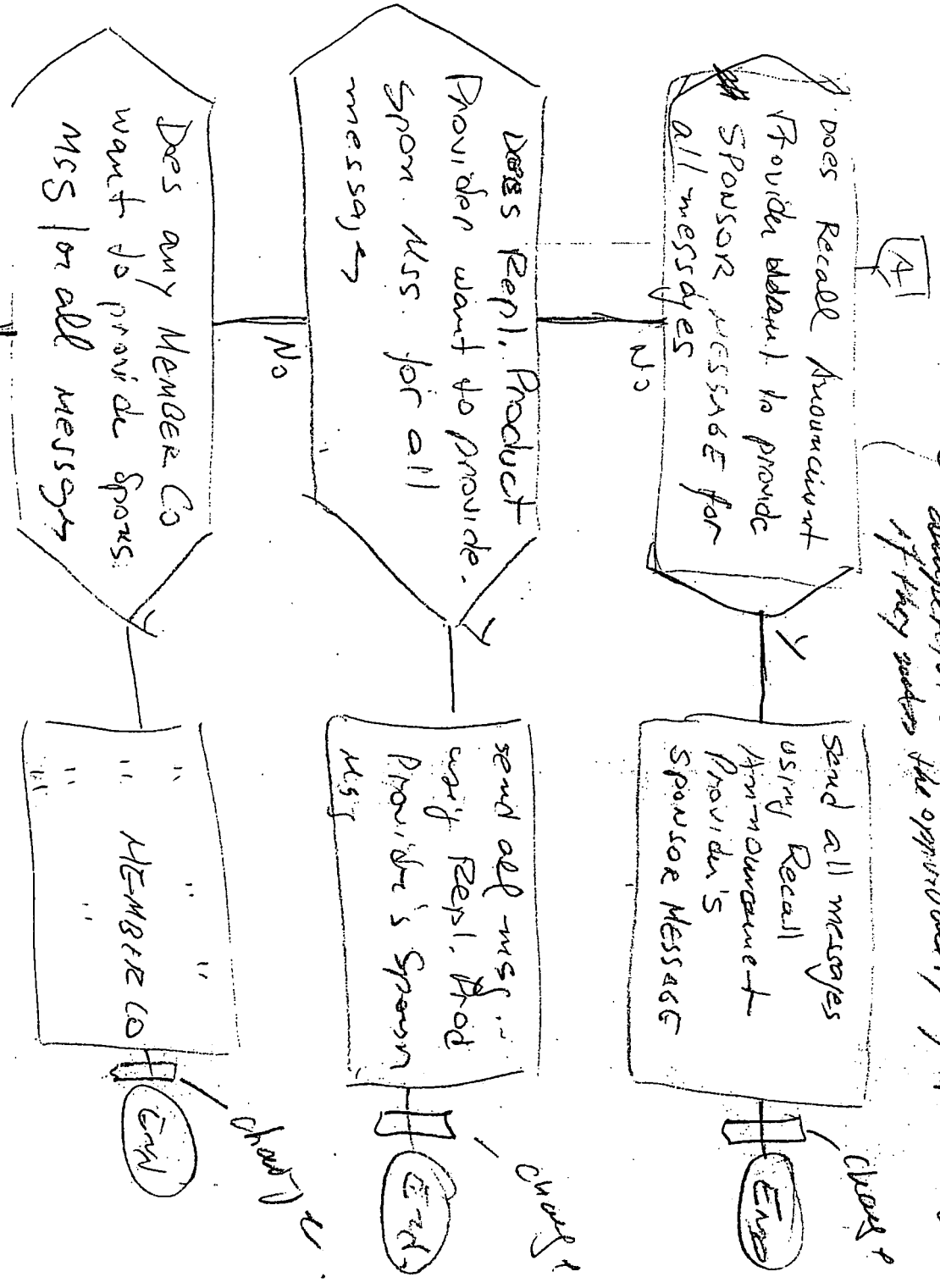
COMPANY PROD. RELATED TO
 DIS/PRODUCT RELATED, TO
 PROVIDE SM



Good because if company for all if they want the opportunity of sponsorship.

WHO WILL DO SW

(3)



2 companies want Policy. No breaks Dead lock. The Policy is co. that sponsored best recently is chosen the sponsor of msg. Dead lock off who sponsored best recently is chosen based on who enrolled with send first.



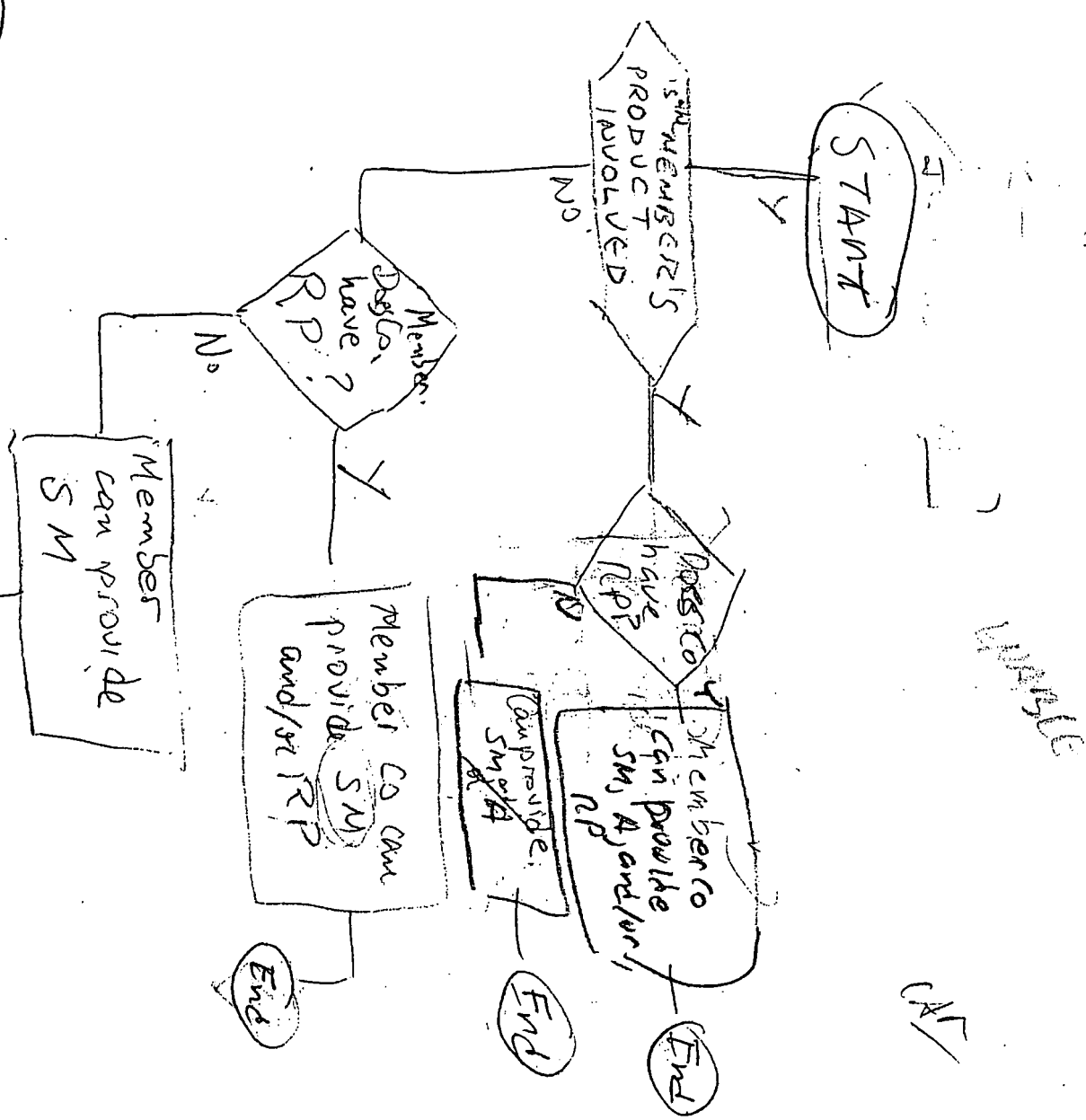


SUBROUTINE

Generate COMPANY Database

Who is willing to pay

①



This Generate ALL CO which have RP, A or

CO SM A RP

① Generate DB. which Co can be involved

column

① ↓

USER DIS

NAME

LIST OF USER'S DIS, READ

PHONE

EMAIL

ADDRESS

PASSWORD

PARTICIPANT CO DIS

NAME OF COMPANY

able to provide RP

able to provide SM

value yes/no

YES/NO



MEMBER CO

Company/Product

Condition

Spencer MSJ

A-
R

USE

2 Reviewed DB E 1 Generated DB F
each week

Generated



Individual

— sub routine: Does company want to provide Sponsor Mgr

START

For this user given

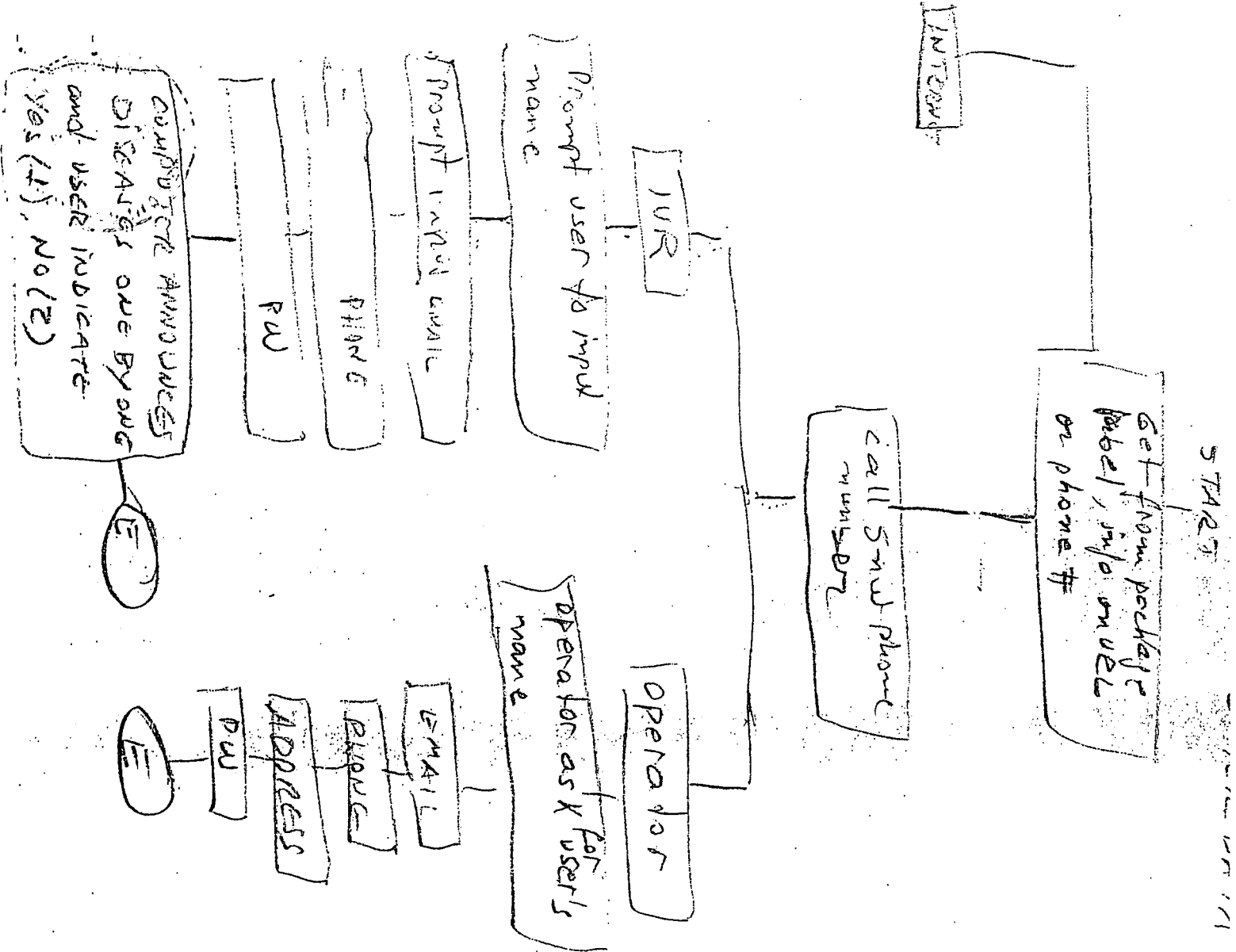
Based on DIS. Record in U-PZ DB.

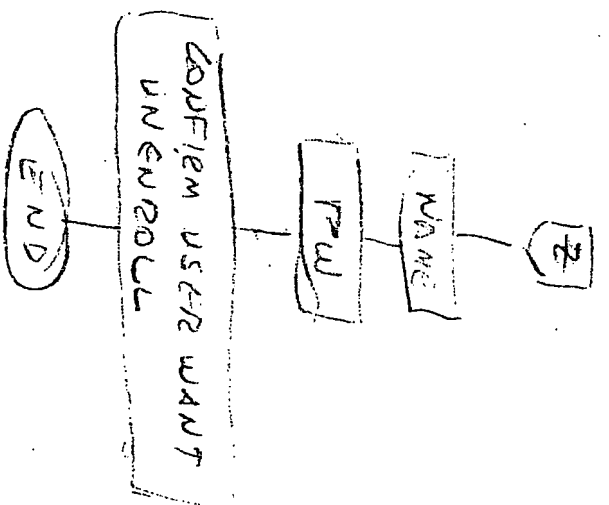
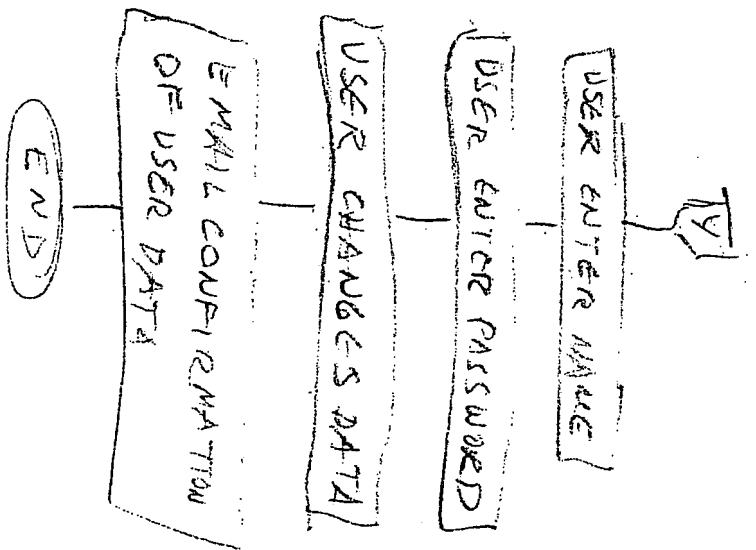
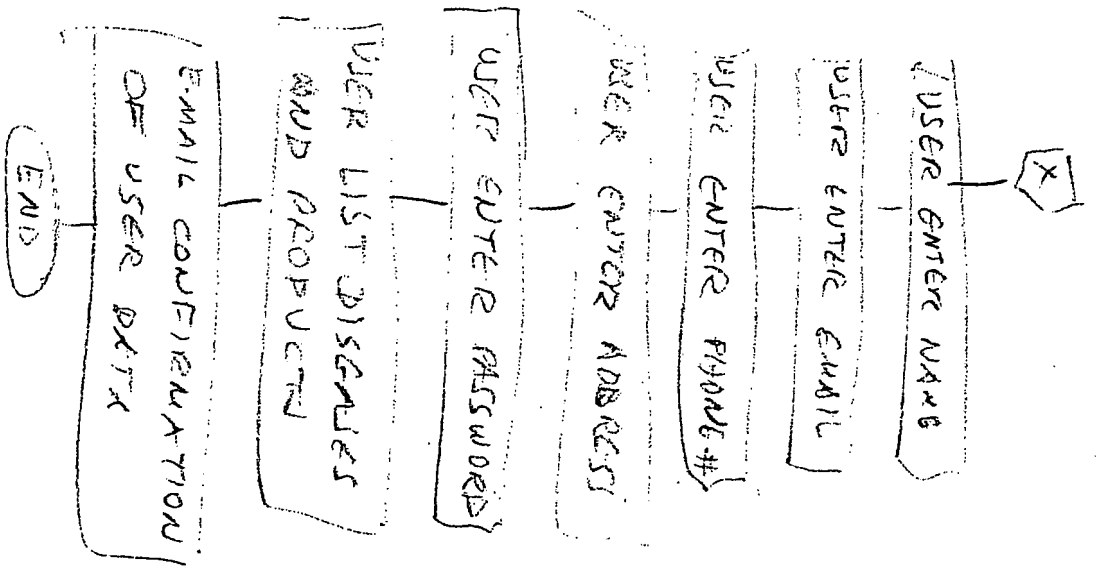
Based on file displays listed for the user which company

START

File Co identified in the Participant Co DB

Does the user have any of the diseases listed by the companies identified in the Participant Co DB





USER ENTER INFO

NAME →
- ENTER
- MAIL → ENTER

